



Aviation

ENGLISH

For ICAO compliance

Henry Emery & Andy Roberts



MACMILLAN



Aviation

ENGLISH

For ICAO compliance

Henry Emery & Andy Roberts
with Ruth Goodman and Louis Harrison


MACMILLAN



INTRODUCTION

This course is for aviation professionals – particularly **pilots** and **air-traffic controllers** – who wish to reach and maintain level 4 (operational) as measured by the **ICAO Language Profile descriptors** (see pages vi and vii). The course aims to increase confidence in communication and develops the very specific skills described in the **ICAO level 4** language profile. These are the skills needed to succeed in any Level 4 assessment and also to function effectively and safely in an aviation environment.

This course does not aim to teach the phraseology that aviation professionals need but it is included to provide a context for the plain English needed for communication between pilots and air-traffic controllers, and between pilots and pilots. The main focus is on the language needed to communicate in non-routine and / or emergency situations during flight operations.

The Student's Book contains the material for the course in the form of reading and listening texts. The main purpose of this is to present new vocabulary and to provide a context for the exercises and language functions. There are lots of pair-work and group-work activities for speaking practice for the benefit of students using the course in a classroom situation.

The course is intended both for **independent study** and for classroom use. The CD-ROM supports the student's book with interactive language and pronunciation exercises, simulations in which the student can participate, and all the audio files from the Student's Book. The Teacher's Book contains extra support and ideas that can be used to supplement the material contained in this Student's Book.



STUDENT'S BOOK

Each of the 12 units in the Student's Book is divided into four two-page sections.

Section 1

is based on a reading text and provides an introduction to the main theme of the unit.

Section 2

is based on a listening text or texts and provides sustained listening and pronunciation practice work.

Section 3

is based on an emergency or non-routine flight operation scenario. It always contains a listening text or texts involving a radio telephony exchange with a mixture of phraseology and plain English.

Section 4

is an extension section which includes further practice, consolidation and extension of language taught within the unit.

CD-ROM

The interactive CD-ROM complements the material in the Student's Book by providing interactive simulations, detailed pronunciation and extra listening. The CD-ROM material is split into 12 units which match those of the Student's Book. It has two sections.

Section 1

contains further practice on pronunciation and listening,

Section 2

contains animated interactive sequences in which students are encouraged to use the language taught in the corresponding unit of the book. Students can compare their own speech with model responses and take the role of characters in the animation.

We hope that you enjoy using Aviation English.

Henry Emery
Andy Roberts

	Topic	Skills	Pronunciation	Functions	Vocabulary
UNIT 1 RUNWAY INCURSION <i>Page 8</i>	1 Avoiding miscommunication	Reading and vocabulary		Asking for information	Communication
	2 Airport layout	Listening and speaking	ICAO alphabet		Prepositions
	3 Ground operations	Listening and speaking	Numbers	Describing actions and position	Verbs describing actions and position
	4 Language development				
UNIT 2 LOST <i>Page 16</i>	1 Across the Pacific	Reading and vocabulary		Explaining abbreviations	Navigation
	2 Finding flight N45AC	Listening and speaking	Past tense endings		Co-ordinates
	3 Lost	Listening and speaking	Confirming and disconfirming		Topographical features
	4 Language development				
UNIT 3 TECHNOLOGY <i>Page 24</i>	1 Datalink	Reading and vocabulary		Expressing purpose	Communications
	2 Flight control systems	Listening and speaking	/b/ and /p/	Saying things another way	Safety
	3 Instrument blackout	Listening and speaking	Sentence stress 1	Giving instructions	The instrument panel
	4 Language development				
UNIT 4 ANIMALS <i>Page 32</i>	1 Wildlife on the ground	Reading and vocabulary		Expressing necessity	Security measures
	2 Animals on the loose	Listening and speaking	Word endings	Expressing preferences; Explaining unknown words	Cargo
	3 Bird strike	Listening and speaking	Sentence stress 2	Saying intentions	
	4 Language development				
UNIT 5 GRAVITY <i>Page 40</i>	1 Ultralight	Reading and vocabulary		Explaining how something works	Manoeuvring an aircraft
	2 Air race	Listening and speaking		Comparing and contrasting	Aerobatics; Units of measurement
	3 Hydraulic loss	Listening and speaking	Tonic stress	Expressing difficulty and offering help	
	4 Language development				
UNIT 6 HEALTH <i>Page 48</i>	1 Is there a doctor on board?	Reading and vocabulary		Expressing cause and effect	Medical emergencies
	2 Stressed?	Listening and speaking	Consonant clusters 1	Making suggestions and giving advice	Symptoms of stress
	3 Medical emergency	Listening and speaking	Intonation of lists	Giving and asking for updates	
	4 Language development				
Pairwork, pages 104–112 Recordings, pages 113–128					

	Topic	Skills	Pronunciation	Functions	Vocabulary
UNIT 7 FIRE <i>Page 56</i>	1 Fire risk	Reading and vocabulary		Obligation, prohibition and permission	Collocations related to fire
	2 Smoke-jumper	Listening and speaking		Orders and requests	Verbs for describing fires
	3 On-board fire	Listening and speaking	/l/ and /r/	Identifying and responding to problems	Electrical problems
	4 Language development				
UNIT 8 METEOROLOGY <i>Page 64</i>	1 Microburst	Reading and vocabulary		Changing the strength of adjectives	
	2 Airport disruption	Listening and speaking		Results and consequences; Repeating information	Weather words
	3 Stormy approach	Listening and speaking	/ʃ/, /s/, /hʃ/, /dʒ/	Warnings	
	4 Language development				
UNIT 9 LANDINGS <i>Page 72</i>	1 Touchdown	Reading and speaking		Describing sensory impressions	Landing gear and braking
	2 Letting down a VIP	Listening and speaking	Consonant clusters 2	Describing 3-D position and movement	Verbs of movement
	3 Undercarriage	Listening and speaking		Resolving misunderstanding	
	4 Language development				
UNIT 10 FUEL <i>Page 80</i>	1 Aviation and global warming	Reading and speaking		Suggesting solutions to problems	Prefixes
	2 Gimli glider	Listening and speaking	Information groups		Fuel collocations
	3 Fuel icing	Listening and speaking	Long and short vowel sounds	Expressing expectation	
	4 Language development				
UNIT 11 PRESSURE <i>Page 88</i>	1 Blast	Reading and speaking		Expressing time and duration	Action verbs
	2 Damage	Listening and speaking	Diphthongs	Summarizing	Types of damage
	3 Emergency descent	Listening and speaking	Contrastive stress	Expressing consequences	
	4 Language development				
UNIT 12 SECURITY <i>Page 96</i>	1 Air rage	Reading and speaking		Focusing on actions	Conflict and restraint
	2 Suspicious passengers	Listening and speaking	-tion, -sion, -cion endings	Expressing possibility and probability	Strange behaviour
	3 Unlawful interference	Listening and speaking	Information groups and stress	Reporting	
	4 Language development				
Pairwork, pages 104–112 Recordings, pages 113–128					

Level	Pronunciation Assumes a dialect and / or accent intelligible to the aeronautical community	Structure Relevant grammatical structures and sentence patterns are determined by language functions appropriate to the task	Vocabulary
Expert 6	Pronunciation, stress, rhythm, and intonation, though possibly influenced by the first language or regional variation, almost never interfere with ease of understanding.	Both basic and complex grammatical structures and sentence patterns are consistently well controlled.	Vocabulary range and accuracy are sufficient to communicate effectively on a wide variety of familiar and unfamiliar topics. Vocabulary is idiomatic, nuanced, and sensitive to register.
Extended 5	Pronunciation, stress, rhythm, and intonation, though influenced by the first language or regional variation, rarely interfere with ease of understanding.	Basic grammatical structures and sentence patterns are consistently well controlled. Complex structures are attempted but with errors which sometimes interfere with meaning.	Vocabulary range and accuracy are sufficient to communicate effectively on common, concrete, and work-related topics. Paraphrases consistently and successfully. Vocabulary is sometimes idiomatic.
Operational 4	Pronunciation, stress, rhythm, and intonation are influenced by the first language or regional variation but only sometimes interfere with ease of understanding.	Basic grammatical structures and sentence patterns are used creatively and are usually well controlled. Errors may occur, particularly in unusual or unexpected circumstances, but rarely interfere with meaning.	Vocabulary range and accuracy are usually sufficient to communicate effectively on common, concrete, and work-related topics. Can often paraphrase successfully when lacking vocabulary in unusual or unexpected circumstances.
Pre-Operational 3	Pronunciation, stress, rhythm, and intonation are influenced by the first language or regional variation and frequently interfere with ease of understanding.	Basic grammatical structures and sentence patterns associated with predictable situations are not always well controlled. Errors frequently interfere with meaning.	Vocabulary range and accuracy are often sufficient to communicate on common, concrete, or work-related topics but range is limited and the word choice often inappropriate. Is often unable to paraphrase successfully when lacking vocabulary.
Elementary 2	Pronunciation, stress, rhythm, and intonation are heavily influenced by the first language or regional variation and usually interfere with ease of understanding.	Shows only limited control of a few simple memorized grammatical structures and sentence patterns.	Limited vocabulary range consisting only of isolated words and memorized phrases.
Pre-Elementary 1	Performs at a level below the Elementary level.	Performs at a level below the Elementary level.	Performs at a level below the Elementary level.

Fluency	Comprehension	Interactions
<p>Able to speak at length with a natural, effortless flow. Varies speech flow for stylistic effect, e.g. to emphasize a point. Uses appropriate discourse markers and connectors spontaneously.</p>	<p>Comprehension is consistently accurate in nearly all contexts and includes comprehension of linguistic and cultural subtleties.</p>	<p>Interacts with ease in nearly all situations. Is sensitive to verbal and non-verbal cues, and responds to them appropriately.</p>
<p>Able to speak at length with relative ease on familiar topics, but may not vary speech flow as a stylistic device. Can make use of appropriate discourse markers or connectors.</p>	<p>Comprehension is accurate on common, concrete, and work-related topics and mostly accurate when the speaker is confronted with a linguistic or situational complication or an unexpected turn of events. Is able to comprehend a range of speech varieties (dialect and / or accent) or registers.</p>	<p>Responses are immediate, appropriate, and informative. Manages the speaker / listener relationship effectively.</p>
<p>Produces stretches of language at an appropriate tempo. There may be occasional loss of fluency on transition from rehearsed or formulaic speech to spontaneous interaction, but this does not prevent effective communication. Can make limited use of discourse markers or connectors. Fillers are not distracting.</p>	<p>Comprehension is mostly accurate on common, concrete, and work-related topics when the accent or variety used is sufficiently intelligible for an international community of users. When the speaker is confronted with a linguistic or situational complication or an unexpected turn of events, comprehension may be slower or require clarification strategies.</p>	<p>Responses are usually immediate, appropriate, and informative. Initiates and maintains exchanges even when dealing with an unexpected turn of events. Deals adequately with apparent misunderstandings by checking, confirming, or clarifying.</p>
<p>Produces stretches of language, but phrasing and pausing are often inappropriate. Hesitations or slowness in language processing may prevent effective communication. Fillers are sometimes distracting.</p>	<p>Comprehension is often accurate on common, concrete, and work related topics when the accent or variety used is sufficiently intelligible for an international community of users. May fail to understand a linguistic or situational turn of events.</p>	<p>Responses are sometimes immediate, appropriate, and informative. Can initiate and maintain exchanges with reasonable ease on familiar topics and in predictable situations. Generally inadequate when dealing with an unexpected turn of events.</p>
<p>Can produce very short, isolated, memorized utterances with frequent pausing and a distracting use of fillers to search for expressions and to articulate less familiar words.</p>	<p>Comprehension is limited to isolated, memorized phrases when they are carefully and slowly articulated.</p>	<p>Response time is slow, and often inappropriate. Interaction is limited to simple routine exchanges.</p>
<p>Performs at a level below the Elementary level.</p>	<p>Performs at a level below the Elementary level.</p>	<p>Performs at a level below the Elementary level.</p>

RUNWAY INCURSION

Section one – Avoiding miscommunication

- 1 Work in pairs. Discuss the questions below. Ask each other questions to get more details.
 - 1 Have you ever worked with someone whose English you didn't understand?
 - 2 What are some of the causes of miscommunication between controllers and pilots? Note down your ideas.
- 2 Read the article about a report from a National Aviation Safety Investigation on tower-pilot communications. Check which of your ideas from activity 1 are included.

A maintenance truck radios the tower. 'Go ahead' says the controller waiting for the driver to make his request. The truck driver, thinking he has received his clearance, drives onto the runway.

Holding short of the runway, the captain asks 'may we cross?' The controller gives the response 'hold short'. The captain understands 'oh sure', and crosses the runway.

A pilot reads back the message 'He will turn right' as 'We will turn right.' Because of his strong accent, nobody realizes the mistake until the plane has gone the wrong way.



A recent report showed that miscommunication is a factor in over 70% of operational errors. The report examined four areas of miscommunication:

- 1 Requests from the pilot that the controller repeat the instructions
- 2 Misunderstandings by the pilot that result in incorrect readbacks
- 3 Failure of the controller to recognize incorrect readbacks
- 4 Either the controller or the pilot confusing the call sign

Several factors increased the possibility of communication breakdown. The most important was the complexity of the instructions. The following instruction, for

example, when analysed, contains eight separate pieces of information, or eight opportunities for miscommunication:

3890, Ground, give way to the second Dornier inbound, then taxi runway 32 left, intersection departure at Gulf, via outer, Charlie, Gulf.

A lack of fluency in English can cause confusion both because of mispronunciation and misunderstanding. But too much fluency in English can also be a dangerous thing! Any idiomatic language or inappropriate plain English can cause misunderstandings. Also, instructions spoken too quickly can be very difficult to understand.

The report made the following recommendations for further improvements in ATC communications:

- Keep instructions short
- Listen to what a pilot reads back
- Speak slowly
- When talking to pilots / controllers who don't speak native English, break up the message into its individual words by using short pauses
- Ask when not sure about a piece of information
- Include the full call sign when giving an instruction or reading back
- Wait for complete aircraft identification following instructions



3 Underline the correct information.

- 1 In the first incident, the maintenance truck driver *misheard / misunderstood* the controller.
- 2 In the second incident, the captain *misheard / misunderstood* the controller.
- 3 In the third incident, *the pilot / the controller / both the pilot and the controller* misunderstood the other person.
- 4 30% of operational errors *involve / do not involve* miscommunication.
- 5 The main cause of misunderstanding is instructions that are *unclear / very complicated*.
- 6 The safest way to communicate is using *simple English / natural, fluent English*.

4 Work in pairs. Discuss the questions.

- 1 What additional recommendation would you add to the reports?
- 2 How could each of the three incidents described at the start of the article be avoided?
- 3 Do you know of any incidents where miscommunication has caused a runway incursion?

Vocabulary – Communication

Try to remember what verbs are used before the following nouns in the article. Then look back at the text to check.

- 1 m _____ a request
- 2 r _____ clearance
- 3 g _____ a response
- 4 r _____ a message
- 5 r _____ a mistake
- 6 r _____ an instruction
- 7 c _____ a call sign
- 8 g _____ an instruction

Functional English – Asking for information

1 Use the verbs in the box to complete the questions from an Aviation Authority survey.

does have must do will did are

Survey

- 1 When _____ you start to learn English?

- 2 How long _____ you been studying English?

- 3 How _____ you try to improve your English outside class?

- 4 What language training _____ you had already?

- 5 What _____ you find most difficult about English?

- 6 How often _____ you use English in your work?

- 7 How much support _____ your employer give you?

- 8 Why _____ you studying English?

- 9 What level of English _____ you be happy with?

- 10 What level of English _____ you have for your job?

2 Work in pairs. Interview each other using the questionnaire.



Speaking – English in aviation

Work in small groups. How far do you agree or disagree with the statements below? Why / Why not?

- 1 A French ATC speaking to a French pilot at a French airport doesn't need to know English.
- 2 It's impossible to understand Americans – they don't speak plain English.
- 3 Pilots have been flying safely for years – they don't need to learn English.
- 4 R / T phraseology is enough to communicate with.
- 5 All pilots and ATCs working with international traffic should have ICAO level 5.



Section two – Airport layout

- 1 Work in pairs. You are going to complete a map of JFK Airport. Student A look at the map on this page. Student B look at the map on p 107. Don't look at each other's maps.

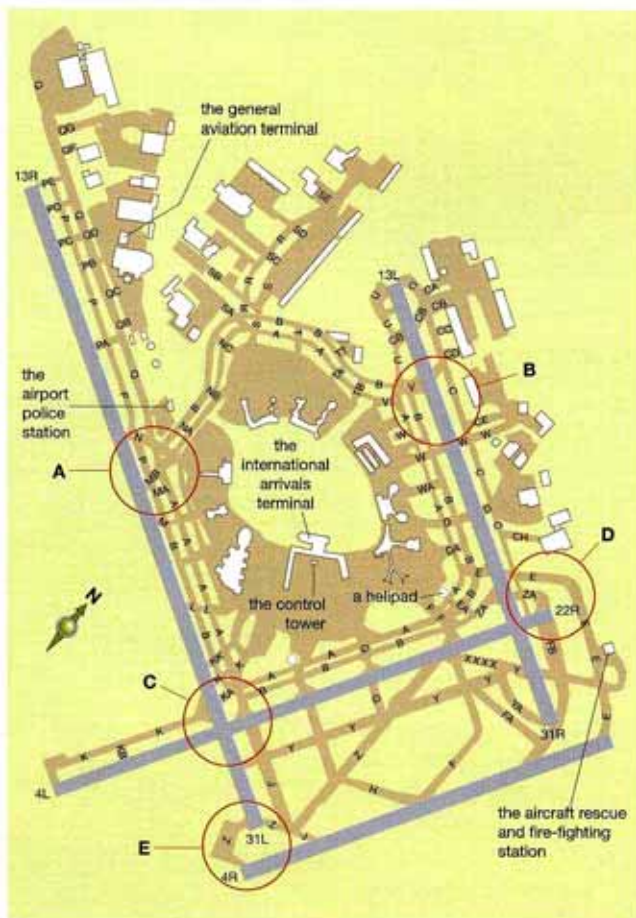
Student A

Find out from Student B where the following buildings and features are. Mark them on your map.

- the airport administration offices
- customs offices
- the national weather service
- the postal service offices
- a helipad

Describe the position of the buildings and features that Student B asks for. The prepositions in the box will be useful.

in the centre of in front of next to behind
opposite to the north of parallel to
on the opposite side of



- 2 01,02,03 Listen to an ATC describing three 'hotspots' at JFK. Which three areas (A–E) on the diagram in 1 does she mention?

1 ____
2 ____
3 ____

- 3 01,02,03 Listen again and match each problem with one of the areas in activity 2.

- 1 Outbound aircraft can easily cross a runway if they miss the taxiway. ____
- 2 You can't see the runway you are taxiing to. ____
- 3 Inbound traffic must turn right to avoid conflict. ____
- 4 You can have a long taxi if you turn left too soon. ____
- 5 You can easily follow the wrong line. ____

- 4 Describe an airport you know, including the taxi circuits for arriving and departing traffic. Are there any hotspots?

Pronunciation – The ICAO alphabet

- 1 04 Listen and write the letters in the correct column in the table according to their stress pattern. The first one has been done for you.

Q R Z N H J S A

oO	Oo	Ooo	oOo
Q			

- 2 04 Listen again and repeat.
- 3 Work in pairs. Add the missing letters of the ICAO alphabet to the table.
- 4 Spell the following items for your partner to write down.
- the town where you were born
 - your full name
 - your address



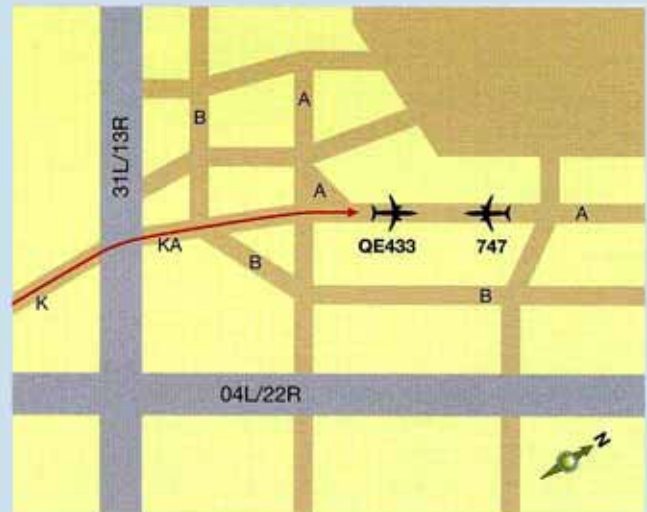
Vocabulary – Prepositions

Below is a controller's report of an incident in area C of the aerodrome. Complete the report with the missing prepositions.

to at ahead on towards into onto across from via along

Controller's report

QE433 landed (1) _____ runway 22R in marginal weather conditions. The crew were issued instructions to taxi (2) _____ the runway (3) _____ the apron on K and B (4) _____ KA. They taxied (5) _____ K, but missed the sign and the runway holding position markings for 13R, and went (6) _____ the active runway and (7) _____ KA on the opposite side. At the same time, a 747 was taxiing (8) _____ position on runway 13R. (9) _____ the intersection with B, the crew missed the arrow pointing right. It continued straight (10) _____ and taxied (11) _____ the terminal on A. QE433 finally came nose-to-nose with the outbound 747.



Speaking – Sketching out an airport

- 1 Work in pairs. Look at the aerodrome information. Design an aerodrome layout including runway and taxiway configuration and the taxi circuit. Mark these positions on your diagram:
 - Where ATC issue runway-in-use information and taxi clearances
 - The holding position(s) in case of traffic conflict
 - Where ATC issue take-off clearance
 - Where ATC issue clearance to taxi to apron
 - Where ATC issue parking information
- 2 Compare your ideas with another pair.

Aerodrome data

Prevailing wind: 230°

Type of traffic: IFR/VFR, private, scheduled, domestic and international

Average daily traffic movements: 1,100

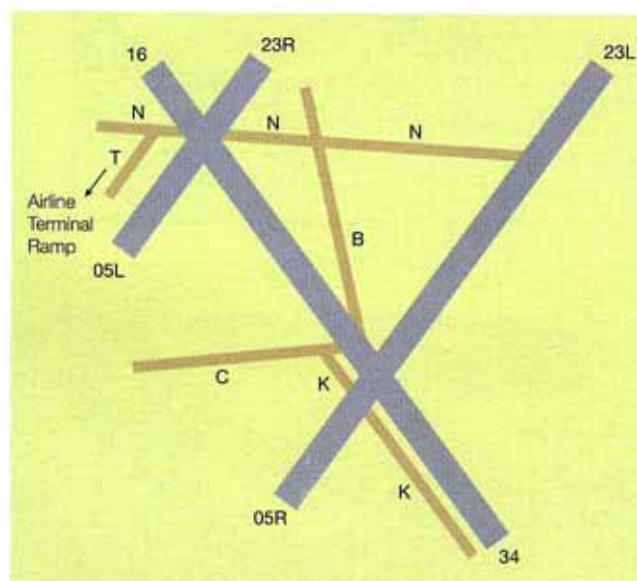


Section three – Ground operations

- 1 Work in pairs. Discuss the questions.
 - 1 What is a runway incursion?
 - 2 What can cause a runway incursion?
 - 3 What can the aviation industry do to reduce the number of runway incursions?
- 2 05 Listen to a dialogue between a tower controller and a pilot. Underline the correct word to complete the summary of the incident.

In *marginal / good* weather conditions, an *inbound / outbound* aircraft takes the incorrect taxiway and moves onto an *active / inactive* runway. Another aircraft *lands / takes off* in front of the aircraft. The tower controller tells the crew to *turn left / stop*. In the end the plane *follows / clears* the runway.

- 3 05 Listen again and mark on the diagram:
 - 1 The route the tower controller expects the plane to take.
 - 2 The route the plane actually takes.
 - 3 The position where the plane stops to wait for further instructions.
 - 4 The position where the tower thinks the plane has stopped to wait for further instructions.



Pronunciation – Numbers

- 1 06 Listen to the call signs. Correct any mistakes.
 - 1 FR369 **396**
 - 2 AQ692
 - 3 CZ310
 - 4 LN488
 - 5 HY557
 - 6 JM402
- 2 Work in pairs. Practise saying call signs.
Student A, go to p 104. Student B, go to p 107.

Vocabulary – Verbs describing actions and position

Put these ground manoeuvres in the correct column according to their speed in routine operations.

stand move-around approach turn push back
head wait roll for take-off taxi queue
touch down exit face

no movement	slow	fast
stand	move around	



Functional English – Describing actions and position

Look at these extracts from the dialogue.

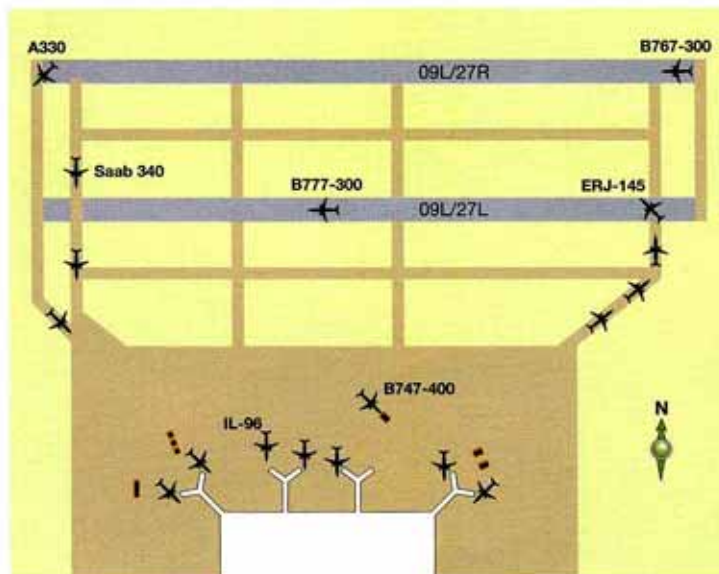
I'm facing Kilo.

*We **are approaching** Charlie on Kilo.*

***There's** somebody **taking off**!*

***There are** signs **showing** the runways.*

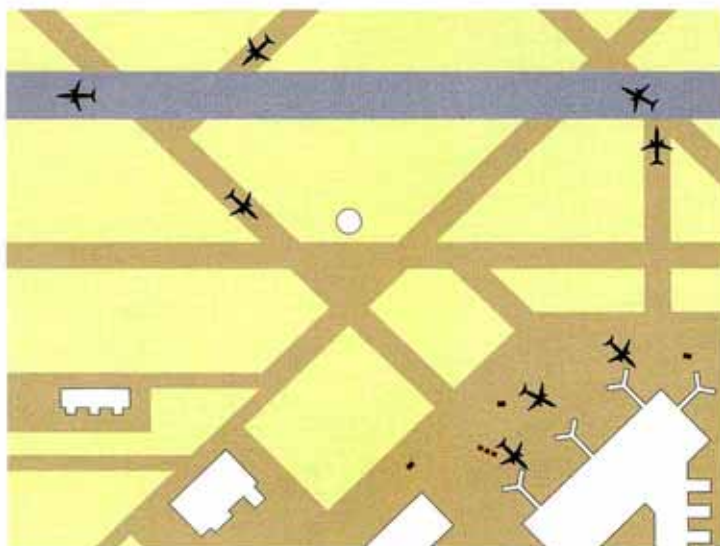
Complete the description of the picture with the verbs from the Vocabulary section in the correct form.



- 1 *There's* a 767-300 touching down on runway 27R.
- 2 An A330 is turning left.
- 3 It _____ the far end of the same runway.
- 4 _____ two aircraft _____ towards the apron.
- 5 A Saab 340 _____ south. It _____ to cross runway 27L.
- 6 On runway 27L a B777-300 _____ for take-off.
- 7 An Embraer ERJ-145 _____ into position.
- 8 After the Embraer, _____ three more aircraft _____ to depart on runway 27L.
- 9 A few service vehicles _____ around on the apron.
- 10 Seven aircraft _____ at the gates.
- 11 A truck _____ a 747-400.
- 12 An IL-96 _____ its gate.

Speaking

- 1 Work in pairs to complete your pictures of an airfield. Student A look at this page. Student B go to p 107.



- 2 Work in pairs. Discuss the questions.
 - 1 What factors increase the possibility of hotspots?
 - 2 What can be done to reduce hotspots?
 - 3 Are hotspots becoming more or less of a problem?
 - 4 Which airports have the most / fewest hotspots?

Section four – Language development

Functional English – Question forms

1 Rearrange the words to make questions.

1 you / aviation / start / career / your / when / did / in?

2 of / aspect / your / do / most / you / job / enjoy / what?

3 have / which / worked / you / at / airports?

4 hours / week / average / how / on / work / many / a / you / usually / do?

5 you / did / problem / in / experience / when / last / English / communication / a?

6 how / to / do / training / often / have / you / attend / courses?

7 language / much / will / training / have / you / year / this / how?

8 long / did / how / to / your / do / job / train / you?

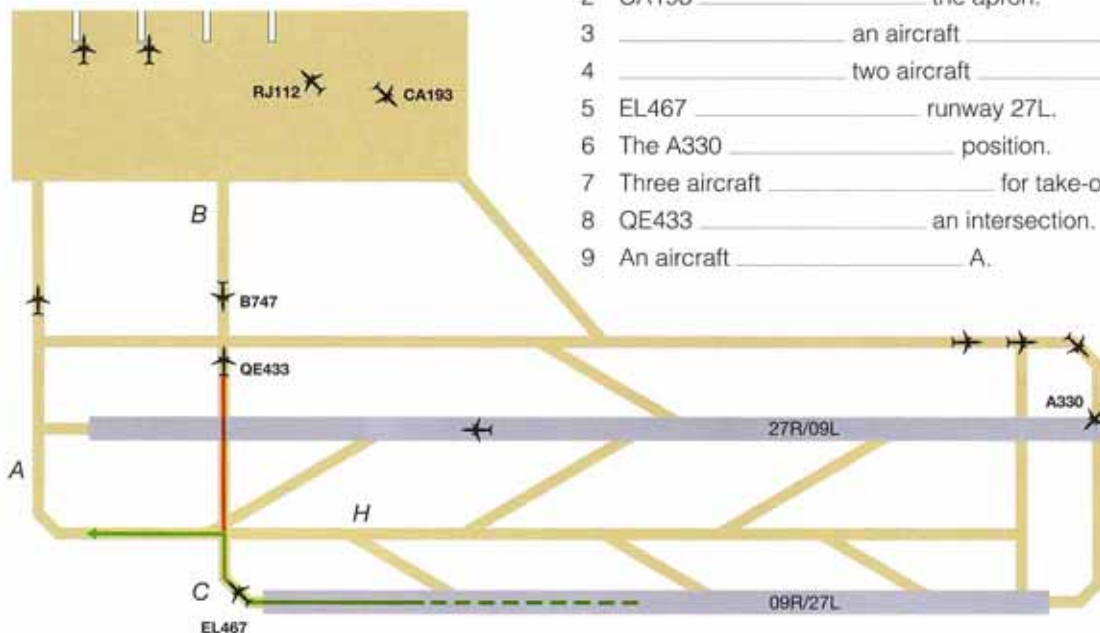
2 Answer the questions using full sentences.

Example

I started my career in aviation five years ago.

Describing actions and position

3 Look at the diagram and complete the description of what the planes mentioned are doing.



- 1 RJ112 _____ its gate.
- 2 CA193 _____ the apron.
- 3 _____ an aircraft _____ on runway 27R.
- 4 _____ two aircraft _____ at the gates.
- 5 EL467 _____ runway 27L.
- 6 The A330 _____ position.
- 7 Three aircraft _____ for take-off on runway 27R.
- 8 QE433 _____ an intersection.
- 9 An aircraft _____ A.



4 Read this report of the incident shown in 3. Complete it with the words from the box.

came nose-to-nose continued straight ahead taxied along landed on taxi from
carried on towards taxiing into went across

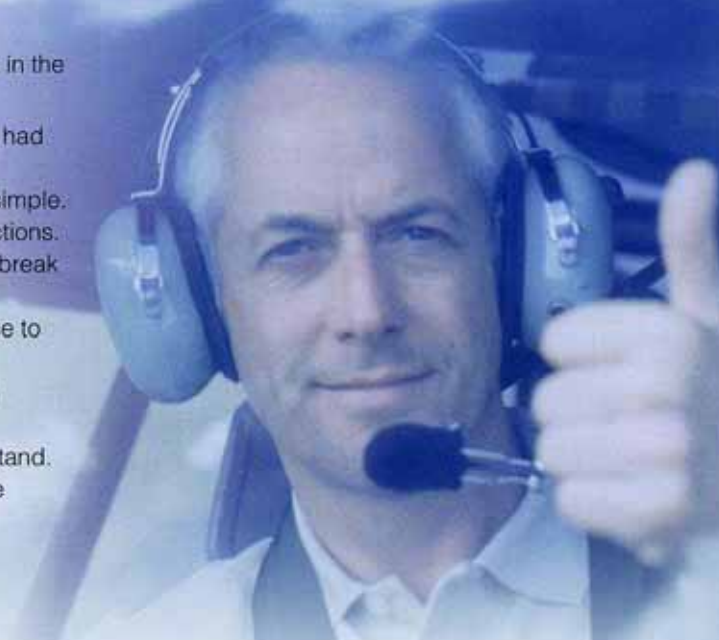
Incident report

QE433 (1) _____ runway 27L in fog. The tower issued instructions to (2) _____ the runway to the apron on C and A via H. It (3) _____ C, but at the intersection with H, the crew missed the arrow pointing left, and (4) _____. They then missed the sign for runway 09L, and (5) _____ the active runway and onto B on the opposite side. At the same time, an A330 was (6) _____ position on runway 27R. QE433 (7) _____ the terminal and (8) _____ with an outbound 747 on B.

Vocabulary – Communication

1 Complete each sentence with a verb related to communication in the correct form.

- When the pilot r _____ the instruction, I realized that he had m _____ me.
- Controllers should k _____ their instructions short and simple.
- Hold short of the runway and w _____ for further instructions.
- Pilots can m _____ complex instructions, so it's best to break them up.
- The truck driver thought the tower had i _____ clearance to cross the runway.
- When r _____ to an ATC traffic call-out, the pilot should i _____ his call sign.
- If a controller m _____ a word, the pilot may not understand.
- If a pilot g _____ an incorrect readback, r _____ the instruction.



Parts of an airport

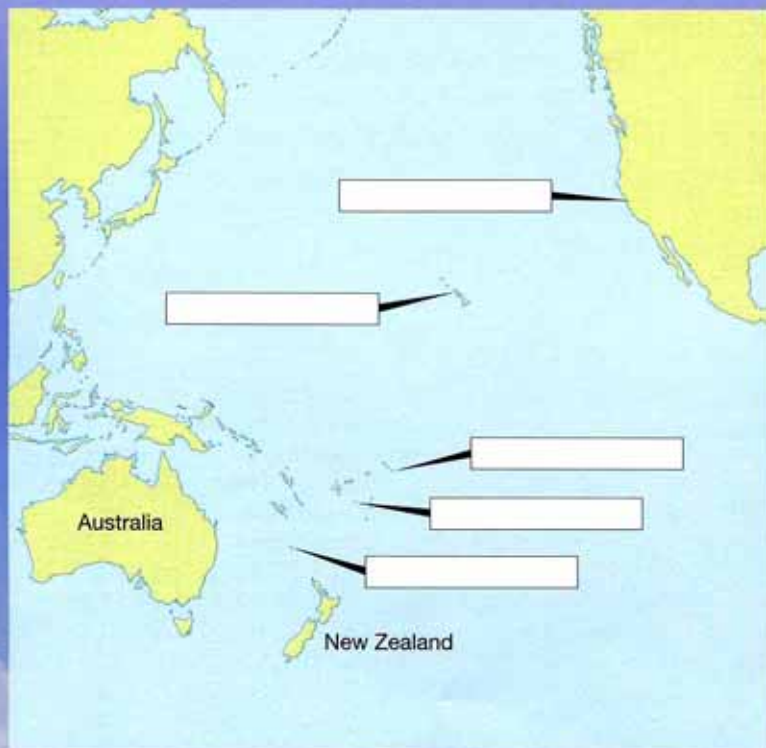
2 Rearrange these letters to make features of an airport.

- | | | |
|----------------------------|--|-------|
| 1 tootpsh | a point in an airport where there is danger of runway incursions | _____ |
| 2 awaxity | a road that planes take to get to and from the runway | _____ |
| 3 worar | a symbol that shows you which way to go | _____ |
| 4 stabl cenef | a barrier that protects an area from the force of jet engines | _____ |
| 5 naggise | letters, numbers and symbols that are positioned around an airport to show pilots where they are and which way to go | _____ |
| 6 menavept krimsang | lines and letters painted on the ground | _____ |
| 7 nittercoseni | a place where two runways, roads, etc. cross | _____ |
| 8 altremin | the main building at an airport | _____ |



LOST

Section one - Across the Pacific



1 Work in pairs. Look at the map and photograph. What particular problems could a pilot of this type of aircraft have on a long flight across an ocean?

2 Match the words below with the definitions a-f.

calculate track fix endurance chart compass destination en route

- | | | |
|---|--|-------|
| a | the longest time an aircraft is able to fly without stopping | _____ |
| b | a map used for planning and marking a route | _____ |
| c | on the way; on the line that your journey follows | _____ |
| d | a piece of equipment that shows your direction | _____ |
| e | the line on a map that an aircraft follows | _____ |
| f | the place you are travelling to | _____ |
| g | a position in space, usually on a flight plan | _____ |
| h | to use mathematics to find out something | _____ |

3 Read the text about the flight on the opposite page. Label the pilot's route on the map.

- 4 Complete the pilot's flight plan.
- 5 Read the text again and answer the questions.

- Who did the pilot work for?
- What navigational equipment did he have on board?
- Why did he leave Pago Pago at 0300?
- Why did he fly on his compass from Ono-I-Lau to Norfolk Island?
- When did the pilot realize there was a problem?

Flight plan

AIRCRAFT	(1) _____
FLIGHT ORIGIN	Oakland, California
FLIGHT DESTINATION	Australia
PERSONS ON BOARD	1
ENDURANCE	(2) _____
ESTIMATED FLIGHT TIME	(3) _____
CRUISING SPEED	(4) _____
TIME OF DEPARTURE FROM PAGO PAGO	(5) _____
DISTANCE TO NORFOLK ISLAND	(6) _____

Solo flight to Norfolk Island

In 1978, pilot Jay E. Prochnow was working for an aircraft sales company in Oakland, California. An experienced civil and military pilot, Prochnow was given the task of delivering a Cessna 188 single-handed from Oakland, to Australia. Because the flight covered thousands of miles over open ocean, the aircraft was fitted with extra fuel tanks for the journey. Apart from charts and a compass, the only navigation equipment he had was an ADF for picking up the HF signals of NDBs scattered across the tiny islands of the Pacific Ocean. At the time, this crossing was a long trip even for big jets. For a single-engine aircraft with one crew, this

was a long and dangerous mission.

After a stopover in Hawaii, he completed the second leg of the journey on schedule, and arrived on the Samoan island of Pago Pago without incident. The pilot rested for one day before he began the third leg of the trip, and he spent his time on the island preparing for the long and tiring flight ahead. The charts showed a distance of almost 1,500 nm to Norfolk Island. Prochnow calculated a flying time of 15 hours minimum, cruising at 110 kt in good VFR conditions with a light wind. He decided to carry maximum fuel and he filled the tanks to give a total endurance of 22 hours.

He planned his flight well. He departed Pago Pago at 0300, and with 15 hours of daylight in front of him, he could make visual contact with the fixes and his destination below him.

Using the NDBs, Prochnow navigated successfully to the fix of the island of Ono-I-Lau, almost directly en route. Now his task was to fly the remaining 850 nm of empty ocean to Norfolk Island with no navigation aids at all. Now he flew by compass alone. A few hours later he came into range of the Norfolk NDB, and he followed the heading indicated by the ADF. As he approached the ETA he looked carefully for the island, but it wasn't in sight.

- 6 Work in pairs. What tips can you think of for pilots planning to fly long-distance in a light aircraft? Make a list. Then compare with the other pairs.

Functional English – Explaining abbreviations

- 1 Here are some common expressions for asking or saying what abbreviations mean. Do you know what these abbreviations stand for?

What does NDB **stand for**? It **stands for** _____

What does ADF **mean**? It **means** _____

What **is** VFR **short for**? It's **short for** _____

- 2 Work in pairs. You are going to practise saying and explaining abbreviations. Student A go to p 104. Student B go to p 107.

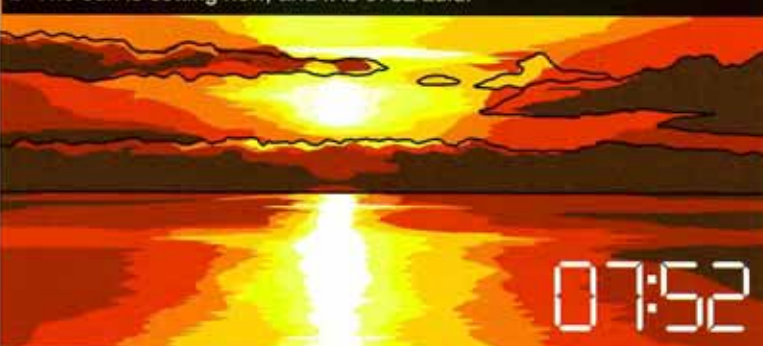


Section two – Finding Flight N45AC

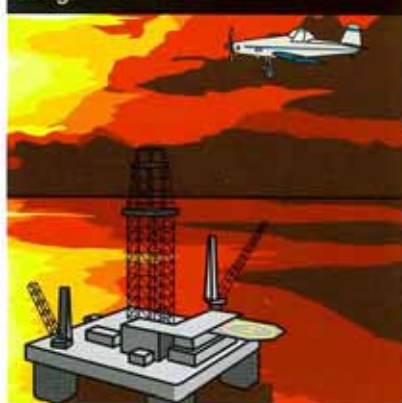
a Wilco. My heading is 274°.



b The sun is setting now, and it is 0752 zulu.



c I can see a light. I think it's an oil rig.



d MAYDAY. MAYDAY. MAYDAY.
Auckland Control. N45AC.
I'm lost.

e We received news of your situation.
We are offering assistance.



- 1 Look at the pictures of what happened next in the Prochnow story. Put them in the correct order.

1 ___ 2 ___ 3 ___ 4 ___ 5 ___

- 2 07,08,09 Listen and check your answers.

- 3 07,08,09 Listen again and circle the correct answer.

- 1 Prochnow contacted
 - a other aircraft in the area
 - b Auckland ATC for help.
- 2 A commercial jet made
 - a radio contact
 - b visual contact.
- 3 Both aircraft flew towards the sun to establish their
 - a heading
 - b position.
- 4 Captain Vette tried to establish Prochnow's exact position using Prochnow's
 - a radio signal
 - b transponder.
- 5 They established the co-ordinates for
 - a Prochnow
 - b Norfolk Island.

Vocabulary – Co-ordinates

- 1 Listen again and complete the co-ordinates.

08

Vette Turn towards the sun and report your heading.

Prochnow Wilco. My heading is (1) _____.

09

Vette N45AC. Sunset on Norfolk Island is 0730 zulu. That means you are (2) _____ and (3) _____ of Norfolk Island.

Vette Your co-ordinates are (4) _____.
You are (5) _____ from Norfolk Island.

- 2 10 Listen and repeat these directions and co-ordinates.

north south east west south-east
north-west south-west north-east
274° 56°E 30°S 170° 21'E 14°32'40.25"N

- 3 Work in pairs. Student A look at the next page,
Student B look at p 108.



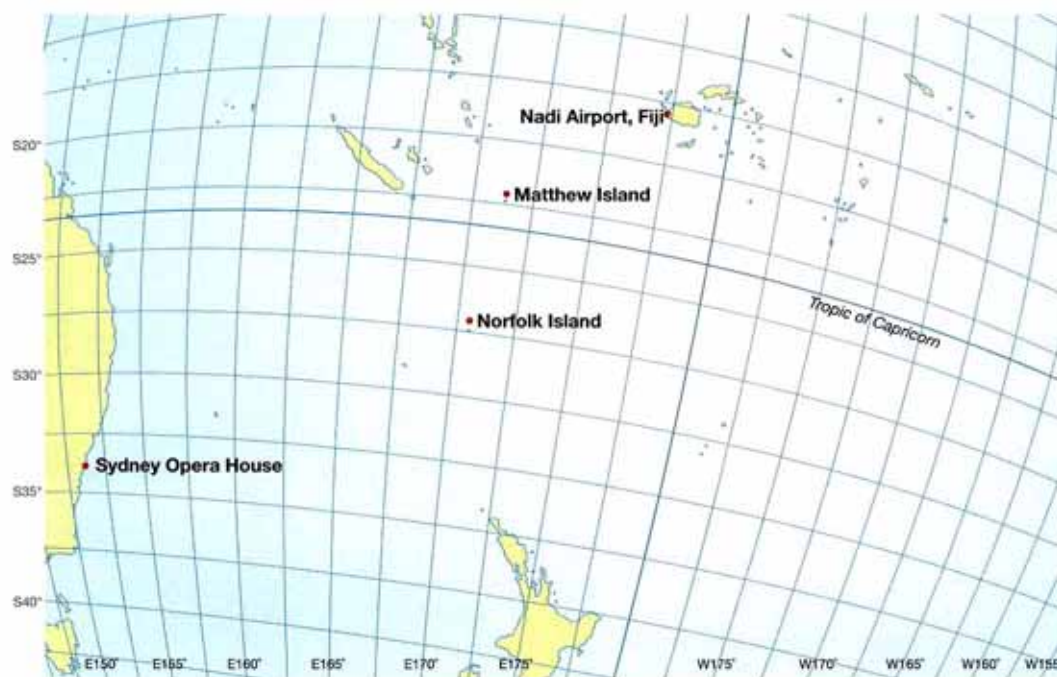
Student A Ask student B what places are at the following co-ordinates.

Write the names of the places in the approximate position on your map.

- | | | | | | |
|---|----------------|-----------------|---|---------------|----------------|
| 1 | 31°03'44.28"S, | 170° 21'07"E | 3 | 20 38'59.26"S | 178°42'00.04"E |
| 2 | 14°16'02.16"S | 170°42'.39.81"E | 4 | 36°55'23.43"S | 174°45'16.22"E |

Example

What do you have at three-one degrees, three minutes, four-four decimal two-eight seconds south, one-seven-zero degrees, two-one minutes, seven seconds east?



Pronunciation – Regular past tense endings

- 1 11 Regular verbs in the past tense have three different sounds at the end of the verb. Listen and notice the verb endings.

/d/ We **received** news of your situation.

/t/ The ADF **stopped** working correctly.

/ɪd/ I **wanted** to have enough light to see my fixes.

- 2 Put the verbs into groups according to the sound of their ending.

contacted departed established tried calculated
followed tasked arrived approached

- | | | | | |
|---|------|-------|-------|-------|
| 1 | /d/ | _____ | _____ | _____ |
| 2 | /t/ | _____ | _____ | _____ |
| 3 | /ɪd/ | _____ | _____ | _____ |

- 3 12 Now listen and repeat.

- 4 Work in pairs. Use words on the right to help you tell the story of Prochnow's flight. Student A, tell the first part of the story. Student B, tell the second part of the story. Use the past tense.

Student A

- Prochnow / leave / Pago Pago / 3.00 a.m.
- decide / carry / maximum fuel
- fill / tanks / endurance / 22 hours
- en route / ADF / stop working
- Cessna / fly / off course
- Prochnow / call Mayday / Auckland ATC

Prochnow left Pago Pago at 3 a.m. He decided ...

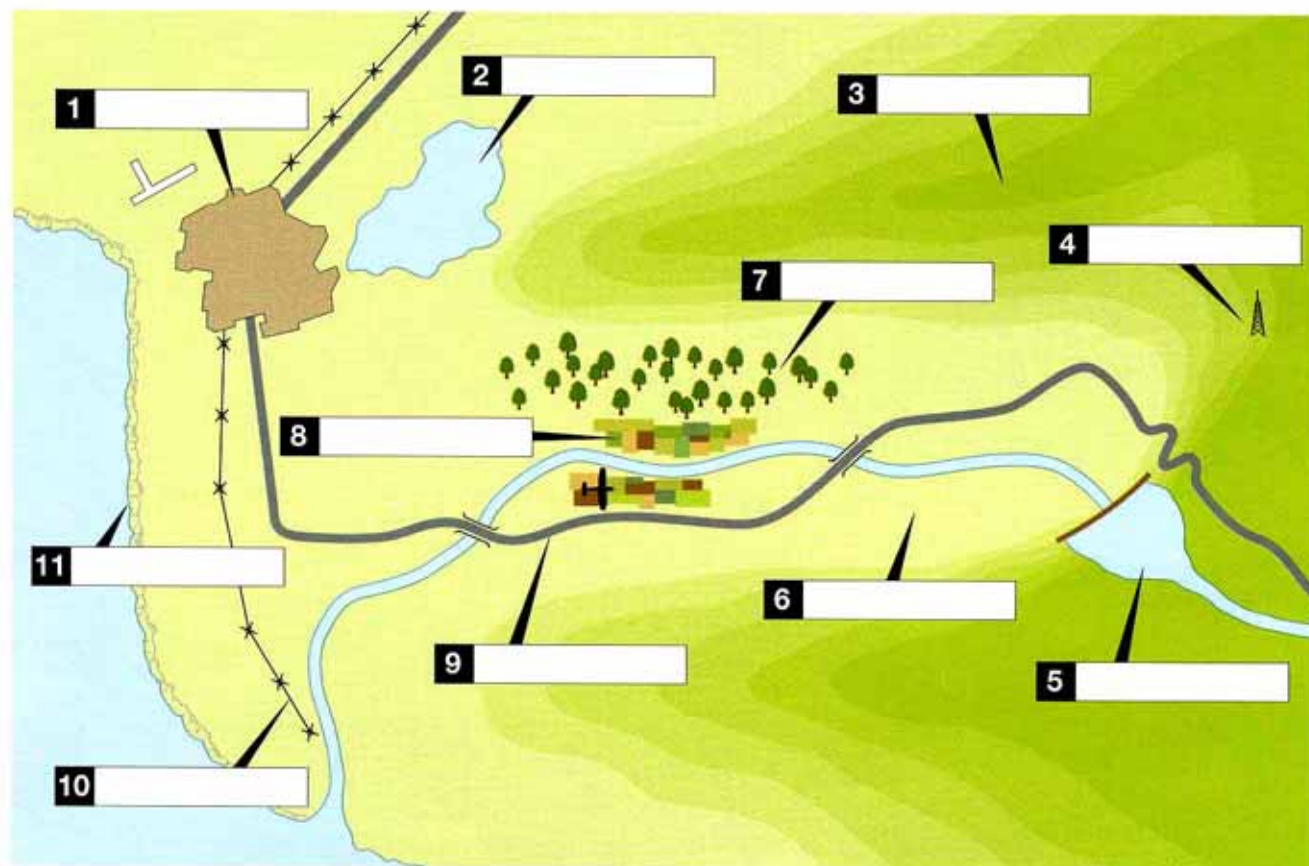
Student B

- Captain Vette / answer / Mayday call
- divert plane / Prochnow's location
- tell Prochnow / fly / sun / establish / position
- fly around / Cessna / find / Prochnow / using radio signal
- direct Prochnow / fly east / Norfolk Island
- Prochnow see / oil rig / Vette guide / to Norfolk Island

Captain Vette answered a Mayday call.
He diverted ...



Section three - Lost



- 1 Match the features in the box to labels 1–11 on the map.

woods highway mast coast power lines lake valley built-up area reservoir high ground fields

- 2 13 Listen to the first part of a dialogue between a lost pilot and a controller. Complete the location report.

Location report

Call sign	TJB
Last known position	(1) _____ miles (2) _____ of CELRA VOR
Aircraft	(3) _____
Altitude	(4) _____
Speed	(5) _____ kt
Fuel	(6) _____ lb
Persons on board	(7) _____
Endurance	(8) _____ hours _____

- 3 14 Look at the map above of the plane's position. Listen to the next part of the conversation and tick (✓) the features in exercise 1 that they describe.
- 4 14 Listen again and draw the pilot's track on the map.



Functional English – Confirming and disconfirming

- 1 14 Listen to the dialogue again and complete the sentences below. They all ask for or give confirmation or disconfirmation.

- 1 _____ you fly into VFR? ☒
- 2 _____ that you can see a road. ☐
- 3 _____ you make out a river? ☐
- 4 _____ the river on the north side of the road? ☐
- 5 _____ that the road crossed the river...? ☐
- 6 _____ a communications mast at 12 o'clock, at about four miles? ☐

- 2 14 Listen again. Tick (✓) where the pilot gives confirmation. Cross (✗) where the pilot disconfirms.

- 3 14 Discuss with a partner which sentence you think is spoken more clearly, (1) or (2). Then listen again to the start of the recording and check if you were right. Discuss the reason for this.

Controller TJB. *Can you fly into VFR?* (1)

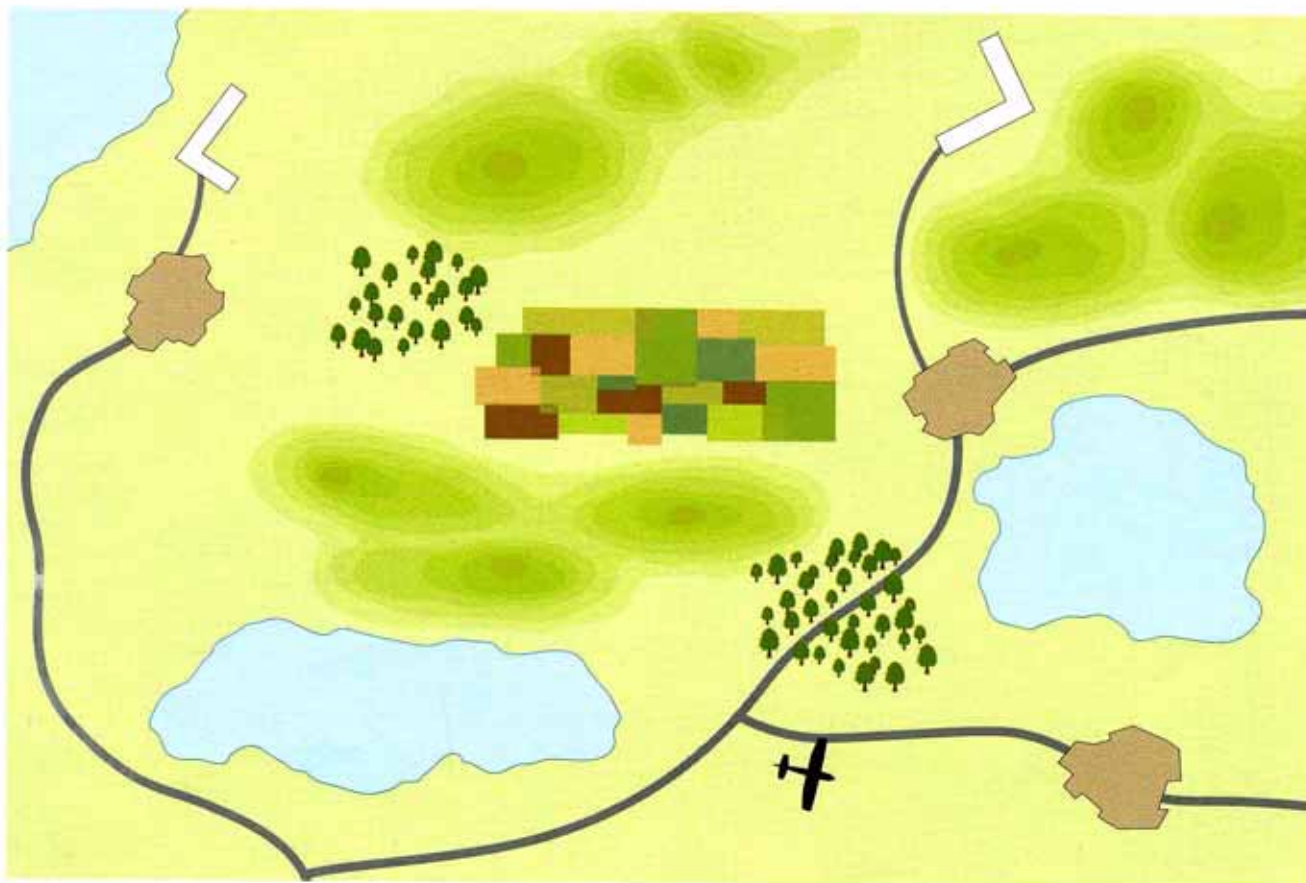
Pilot Affirm ... I can see high ground to the north. I'm flying up a valley, with woods to the north, and fields below me. There is a road below me.

Controller TJB. *Confirm that you can see a road.* (2)

Pilot Affirm. I can see a road.

Speaking

Work in pairs. Student B, turn to p 108. Student A, you are a pilot who is lost and low on fuel. Look at this page. Describe your position to Student B – the ATC – who will direct you to the nearest airstrip using visual fixes. Use the phrases from 1 for confirming and disconfirming.





Section four – Language development

Functional English – Simple past

- 1 Complete the text with the past simple form of the verb in brackets.

A plane carrying 20 passengers heading for Busan (1) _____ (make) an emergency landing yesterday. The emergency (2) _____ (happen) after the pilot (3) _____ (report) a technical problem. The flight (4) _____ (depart) Seoul at 0700 and (5) _____ (fly) towards Busan. The flight (6) _____ (not reach) Busan, but (7) _____ (land) in Daegu shortly after 0800. The pilots (8) _____ (believe) there (9) _____ (be) a fire. The passengers (10) _____ (not be) hurt.

- 2 Complete the conversation with questions.

Journalist (1) _____ (you / make) an emergency landing?
Captain Because we thought we could smell smoke on the flight deck.
Journalist (2) _____ (you / notice) the problem?
Captain About 40 minutes after we left Seoul.
Journalist (3) _____ (you / decide) to land immediately?
Captain Yes, of course.
Journalist (4) _____ (you / land) at Daegu?
Captain We descended to Daegu because it was our closest airfield.
Journalist (5) _____ (the fire / start)?
Captain We're not really sure – perhaps it was an electrical fault.
Journalist (6) _____ (you / have) on board?
Captain We had 18 passengers with us.

- 3 Complete this newspaper report using the verbs in the box in the past simple tense.

avoid be (x2) blame cross detect happen issue not tell steer take place

Two planes were less than a mile away from a major catastrophe when a near-collision (1) _____ in thick clouds above London.
 A Boeing 747 and a Gulfstream jet only (2) _____ each other when their internal warning systems (3) _____ human error and automatically (4) _____ away from danger.
 The Boeing 747 (5) _____ heading towards Heathrow Airport from Japan and the business jet (6) _____ en route from Sardinia to Luton Airport when their paths (7) _____ over London.
 The incident (8) _____ in July last year near to Southam, and the Air Accident Investigation Branch today (9) _____ its report into the incident.
 It (10) _____ the pilot of the Boeing 747, who was flying "too fast" as the plane began its landing procedures and (11) _____ Air Traffic Control of his speed.



Confirming and disconfirming

4 Complete the dialogue with the words in the box.

affirm can see confirm that give further negative say last that correct what you

- Pilot** MAYDAY. MAYDAY. MAYDAY. Tibruk Centre, IG21. We're lost.
ATC IG21 Tibruk Centre. Roger emergency. (1) _____ known position.
Pilot Last known position was 10 miles north of Tibruk.
ATC IG21. Last known position was 10 miles north of Tibruk. Is (2) _____ ?
Pilot (3) _____. Last known position was 10 miles north of Tibruk.
ATC IG21. Please tell me (4) _____ see now.
Pilot I (5) _____ a communications mast directly west and a lake below me.
ATC IG21. (6) _____ you can see a communications mast to the east.
Pilot (7) _____. The communications mast is to my west.
ATC IG21. Turn left 45° and head west to the communications mast.
 We'll pick you up on radar from there and (8) _____ instructions.

Vocabulary

1 Match these verb and noun combinations from the text **Lost**. Then check in the text.

- | | |
|------------|-----------------------------|
| 1 cover | a by compass |
| 2 complete | b the second leg |
| 3 cruise | c a heading |
| 4 make | d thousands of miles |
| 5 navigate | e into range of an NDB |
| 6 fly | f the ETA |
| 7 come | g at 110 kt |
| 8 follow | h to a fix |
| 9 approach | i visual contact with a fix |

2 Work in pairs. Try to remember the missing verbs spoken by Captain Vette.

N45AC. (1) M_____ your position, so we can (2) e_____ your position using the radio signal. We'll (3) m_____ our heading until we (4) l_____ contact. Then we will (5) t_____ left to (6) r_____ contact, and then try to (7) b_____ you in this way. We'll (8) c_____ you again very soon. N45AC. It's (9) g_____ dark. What time is your sunset?

3 Write the words below in the appropriate category. Use your dictionary to help you.

<div>bridge</div> <div>desert</div> <div>footpath</div> <div>cemetery</div> <div>farmland</div> <div>high terrain</div> <div>lighthouse</div> <div>harbour</div> <div>marshland</div> <div>plain</div> <div>ridge</div> <div>urban area</div>	type of land	feature
---	--------------	---------

Section one – Datalink

- 1 Look at the pictures of Datalink communication system. Tell the group what you know about this technology.
- 2 Work in pairs. Before you read the article, note down advantages and disadvantages of using text rather than voice communication.
- 3 Read the text. Tick (✓) your ideas that are mentioned.

IS THIS THE END FOR VOICE COMMUNICATION?

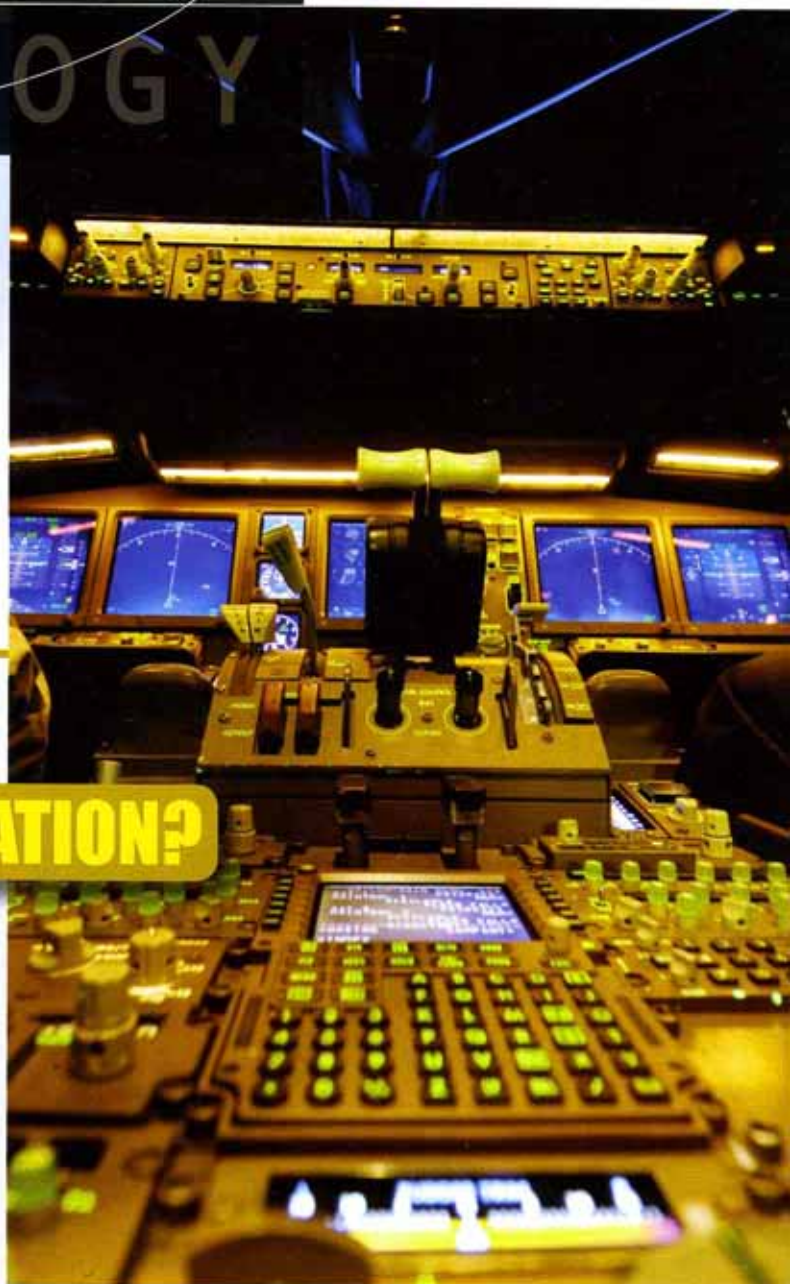
Datalink allows routine air traffic instructions and requests to be sent as text messages instead of via traditional voice communications. The pilot uses Datalink for requesting changes of level or speed, while the controller uses it to give **clearance** for level or speed changes and **frequency** changes. Controllers also use it in order to manage a larger number of aircraft – some claim it could eventually increase **capacity** by 40%.

Clear traffic instructions sent in a pre-formatted text message avoid the need for repetition, and reduce communication errors such as simultaneous **transmissions** and misheard instructions and requests. The messages are delivered in near-real time, and with higher reliability than voice transmissions. Datalink has reduced airspace **congestion**, and many people think it has helped to make communications fast and safe.

However, Datalink also has its drawbacks. It allows 'free text' messages, so that the crew can use their own words to deal with non-routine events. However, even when the pilot writes the message carefully, controllers sometimes do not understand the message, as they may not use the same words and abbreviations, especially when they do not speak the same language. Using text

also increases the crew's workload – in an emergency situation, they cannot afford the **heads-down time** required to read and write messages. Another drawback is that when Datalink messages get out of **sequence**, pilots do not have the time to match messages to responses. Finally, in a mixed voice-data **environment**, the crew's attention is divided, making it easier to miss a voice call.

There can be no doubt that Datalink has an important place in the future of civil aviation communications. But when we need to communicate beyond simple routine messages – for example, in an emergency – there is no substitute for talking.





4 Read the text again and decide if the sentences are true or false. Write *T* or *F*.

- 1 Datalink reduces voice communication by 40%. _____
- 2 The pilot receives a text message almost immediately. _____
- 3 Datalink allows you to write your own messages when necessary. _____
- 4 Datalink messages don't use abbreviations. _____
- 5 It is possible to communicate by voice and text at the same time. _____
- 6 The writer doesn't believe that Datalink should completely replace voice communication. _____

5 Work in pairs. Discuss the question.

If you had the choice whether or not to use Datalink in your job, what would you decide? Why?

Vocabulary – Communications

Find bold words in the text that match the definitions.

- 1 spoken messages sent over the radio _____
- 2 a situation where too many people are using a system _____
- 3 the wavelength that is used for radio communication _____
- 4 a place that uses a particular type of system _____
- 5 official permission to do something _____
- 6 the correct order _____
- 7 the maximum that a person or system can deal with _____
- 8 time spent reading or writing _____

Functional English – Expressing purpose

1 Look back at the text to complete the sentences.

- 1 The pilot uses Datalink _____ requesting changes of level or speed ...
- 2 ... the controller uses it _____ give clearance for level or speed changes and frequency changes.
- 3 Controllers also use it _____ manage a larger number of aircraft.
- 4 It allows 'free text' messages, _____ the crew can use their own words to deal with non-routine events.

2 Complete the sentences using the words and phrases from 1. Note that either *to* or *in order to* can be used in some sentences.

- 1 Commercial aircraft carry a CVR _____ recording communications in the cockpit.
- 2 Large aircraft are equipped with TCAS _____ reduce the danger of mid-air collisions.
- 3 Flight schools use simulators _____ pilots can learn to fly in safe conditions.
- 4 The sterile cockpit rule was introduced _____ make sure flight crew keep their concentration during take-off and landing.
- 5 Many pilots prefer to use the EFB rather than paper _____ performing flight management tasks.
- 6 Crash investigators rely on the FDR _____ analyze an aircraft's behaviour before the accident.
- 7 One part of a glass cockpit display is used for EICAS, _____ the crew can keep a constant eye on what the engines are doing.
- 8 The head-up display was developed _____ allow pilots to read important data without having to look down.

Speaking – The perfect technology

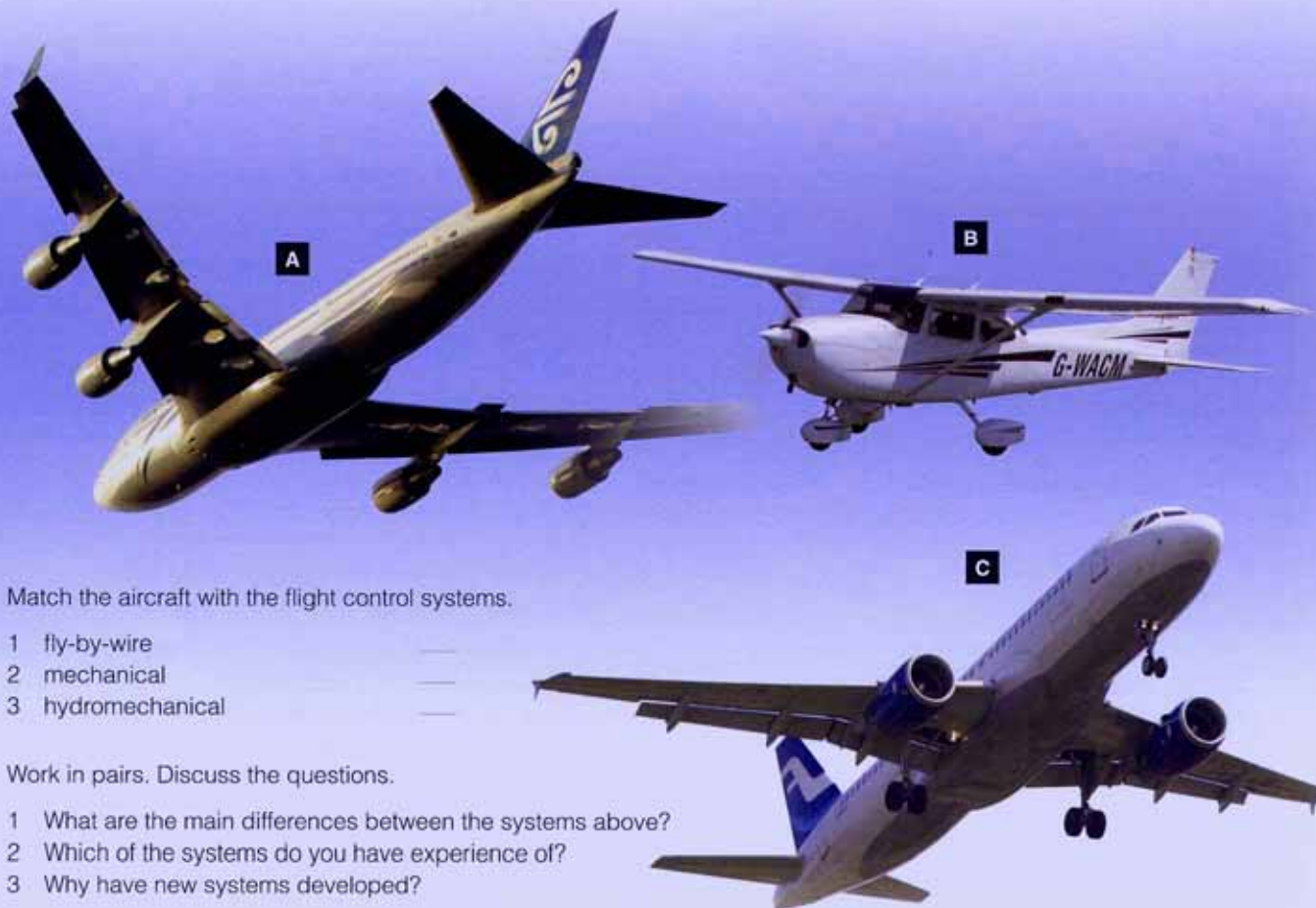
Work in pairs. Imagine a piece of future technology that solves most of the present problems of pilot-ATC communication. Note down your ideas then describe the technology to the class. Think about:

- what it does
- how it is used
- why it improves safety
- how it makes users' work easier.





Section two – Flight control systems



1 Match the aircraft with the flight control systems.

- 1 fly-by-wire _____
- 2 mechanical _____
- 3 hydromechanical _____

2 Work in pairs. Discuss the questions.

- 1 What are the main differences between the systems above?
- 2 Which of the systems do you have experience of?
- 3 Why have new systems developed?

3 Complete the sentences with the words below.

override ultimate control capability built-in limits

- 1 If a pilot has _____, then he takes the final decision on controlling the aircraft.
- 2 When the flight control system is completely automatic, the pilot's _____ is reduced.
- 3 The points that a pilot cannot go past which are part of the flight control system are called _____.
- 4 To cancel or change an automatic action, we use the _____ function.

4 15 Listen to a discussion between an airline employee and pilot, and answer the questions.

- 1 Why does Jean want Mehmet's opinion about two planes?
- 2 What two aircraft are they talking about?
- 3 Why does Mehmet mention Habsheim and Colombia?
- 4 Which plane does Mehmet think is safer?





5 🎧 15 Listen again and underline the correct information.

- Both aircraft use *mechanical* / *fly-by-wire* / *intelligent* flight control systems.
- The Airbus gives final control to the *flight control system* / *pilot* / *first officer*.
- At the Habsheim airshow, the computer didn't allow the pilot to *pull up* / *land correctly* / *retract the air brakes*.
- In Columbia, a computer could have stopped the pilot *flying too quickly* / *keeping the speed brakes on* / *climbing*.

Functional English – Saying things another way

1 🎧 15 Listen again and complete these sentences from the conversation.

- Sorry Mehmet – can you just _____ 'fly-by-wire' _____?
- I'm not _____ mean by 'an override function'.
- In _____, the Airbus computer doesn't allow pilots to do any thing dangerous.
- So _____, on an Airbus the computer has ultimate control ...
- Can _____ an example?
- And there are protections to prevent overspeed. _____, it stops the pilot from going faster than is safe.
- To put _____, sometimes the aircraft should allow manual control.

2 Work in pairs. Take turns to explain how to use a communication system or gadget that you use regularly. When your partner is speaking, ask for explanations as often as possible. Try to use language from 1.

Vocabulary – Safety

🎧 15 Complete the expressions with the verbs from the box, then listen again and check.

reduce stop do allow prevent increase limit make

- | | |
|----------------------------|--------------------------------|
| 1 _____ anything dangerous | 6 _____ the pilot's capability |
| 2 _____ safety | 7 _____ manual control |
| 3 _____ the pilot climbing | 8 _____ the pull-up capability |
| 4 _____ overspeed | 9 _____ an accident |
| 5 _____ it safer | |

Pronunciation – /b/ and /p/

1 🎧 16 Listen to eight words. Write A or B, according to the word you hear.

- | A | B | | A | B | |
|----------|------|-----|----------|--------|-----|
| 1 bought | port | ___ | 5 lab | lap | ___ |
| 2 bat | pat | ___ | 6 peg | beg | ___ |
| 3 tab | tap | ___ | 7 stable | staple | ___ |
| 4 bet | pet | ___ | 8 bit | pit | ___ |

2 🎧 16 Listen again and repeat the words.

3 Take turns to read one word from each line. The person listening must say if they hear A or B.

4 Now practise these sentences.

- Boeing and Airbus should use the best of both systems.
- There are protections to stop overspeed.

Speaking

Work in groups. Discuss the questions.

- In your opinion, is fly-by-wire safer than a conventional mechanical control system?
- In fifty years' time, how do you think flight control systems will be different?



Section three – Instrument blackout

1 Match the words to the picture. Write a–h.

- | | |
|--|-------|
| 1 upper ECAM (electronic centralized aircraft monitor) display | _____ |
| 2 lower ECAM display | _____ |
| 3 autopilot | _____ |
| 4 radio management panel (RMP) | _____ |
| 5 primary flight display (PFD) | _____ |
| 6 secondary flight display | _____ |
| 7 speed, altitude and attitude display | _____ |

2 Work in groups. Explain the function of each item.

3 Match the two halves of the sentences.

- | | |
|----------------------------|------------------|
| 1 Let's reboot | a are down. |
| 2 We've lost | b power back. |
| 3 OK, let's get the system | c back online. |
| 4 We have a system | d this out. |
| 5 The system is | e the system. |
| 6 All the flight displays | f going again. |
| 7 Let's check | g is out. |
| 8 The upper ECAM display | h the autopilot. |
| 9 We've got | i failure. |

4 17 Listen to a conversation from the flight deck of an Airbus A319. Choose a, b or c to complete the sentences.

- There is a problem with the:
 - fuel system
 - electrical system
 - pressurization system.
- The pilots solve the problem by:
 - reading instructions on the ECAM screen
 - reading instructions in the manual
 - getting help from maintenance on the ground.
- The pilots decide to:
 - continue their original flight plan
 - land immediately
 - enter a holding pattern.



Functional English – Giving instructions



18 Complete the sentences from the dialogue.
Listen and check.

- 1 _____ Centre and _____ them what's happening.
- 2 _____ the system.
- 3 _____, read the instruction. _____ follow it.
Check it _____ you delete it.
- 4 What's the _____ instruction?
- 5 First, _____ contact ATC so they know our situation.

Pronunciation – Sentence stress 1

1 18 Listen to the first sentence again. Notice how the words that carry the main meaning of the sentence have the most stress.

Call Centre and tell them what's happening.

Circle the stressed part of the words you think carry the main meaning in the sentences 2–5 in the Functional English section, then listen again and check.

5 17 Answer the questions, then listen again and check.

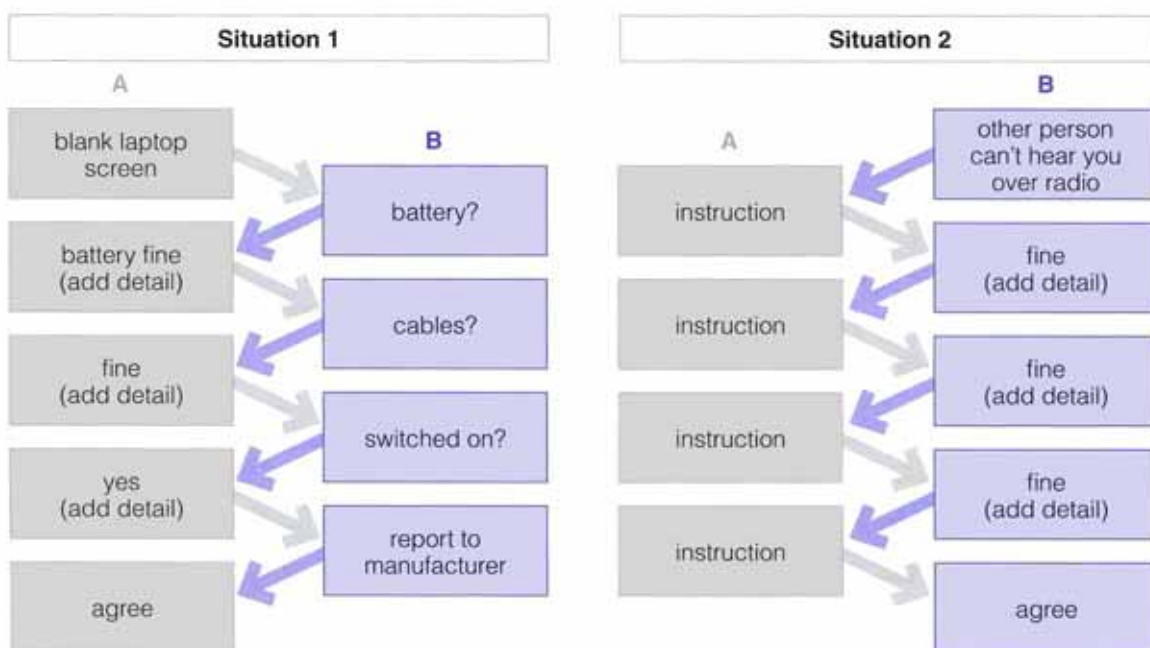
- 1 Why can't the pilots see?
- 2 What equipment on the flight deck fails?
- 3 Why don't ATC respond to the mayday call?
- 4 Where exactly are the instructions?
- 5 How many instructions do the crew follow to solve the problem?

6 Work in pairs. Discuss the questions.

- What equipment at work do you have the most problems with? What is the procedure when it won't work?
- What was the last serious problem you had?

Speaking

Work in pairs. One of you has a technical problem. A colleague looks at a troubleshooting guide on the Internet, and gives you instructions over the phone. Use expressions from the unit, and add as many details as you can.



Section four – Language development

Functional English – Expressing purpose

1 Match the beginnings and endings of the sentences.

- | | |
|--|---|
| 1 Repeat the message slowly so that | a restoring it to flying condition. |
| 2 We had to dump some of our fuel in order to | b having all aircraft use this technology in the near future. |
| 3 Controllers and pilots use Datalink to | c discovering ways to reduce aircraft noise. |
| 4 Investigations are carried out for the purpose of | d learning about the latest technologies. |
| 5 Research is being done with the aim of | e expanding its student capacity. |
| 6 A Datalink trial was done with a view to | f land safely. |
| 7 The training school is raising money with the objective of | g the engine didn't catch fire. |
| 8 They're working on the old plane with the intention of | h avoiding similar incidents in the future. |
| 9 They switched off the fuel pumps so that | i I can understand. |
| 10 We went to the conference for the purpose of | j communicate with each other. |

Saying things another way

2 Rearrange the words to make sentences.

- 1 is / do / mean / of / order / out / radar / that / the / you?

- 2 clarify / I'm / me / let / say / to / trying / what

- 3 'unlawful interference' / could / explain / just / means / what / you?

- 4 basically / continue / need / so / heading / to / with / you / your / current

- 5 do / mean / what / you?

- 6 an / could / me / explanation / give / you?

- 7 sure / I / that / not / I'm / understand

- 8 an / give / can / example / me / you?

- 9 allow / computer / doesn't / fly / in / manually / other / pilot / the / the / to / words

- 10 another / have / it / problem / put / serious / to / way / we / a

Giving instructions

3 Match the verbs 1–10 with the words or phrases a–j.

- | | |
|-------------|--------------------|
| 1 access | a an emergency |
| 2 contact | b again |
| 3 declare | c the ECAM |
| 4 do | d the instructions |
| 5 follow | e going |
| 6 keep | f descent |
| 7 lock | g ATC |
| 8 request | h engine 1 |
| 9 shut down | i the cabin door |
| 10 try | j a complete check |





Vocabulary – Communications

1 Complete the sentences with the words in the box.

speak sequence voice understand text words send routine transmissions congestion
communications select pre-formatted responses give message repetition missed deliver

- 1 It is easier to _____ directly to a pilot rather than write a _____.
- 2 Datalink allows pilots and ATCs to _____ text messages for _____ communications.
- 3 The problem with _____ transmissions is that the speaker may be difficult to _____.
- 4 Datalink allows users to create _____ messages using their own _____.
- 5 Datalink has the potential to make _____ safe and fast and to reduce _____ on the frequency.
- 6 Datalink users just need to _____ from a list of _____ text messages.
- 7 Datalink systems _____ messages between pilots and controllers.
- 8 It can take time to match messages to _____ when messages get out of _____.
- 9 If controllers _____ clear traffic instructions, it reduces the need for _____.
- 10 Using a Datalink system could help with the problem of _____ voice _____.

Vocabulary from the unit

2 Complete the sentences with the verbs from the unit.

afford allow avoid have help need permit required

- 1 Datalink exists to _____ to make communications more efficient.
- 2 Maintenance staff will _____ to conform to the new safety requirements whether they like it or not.
- 3 Air traffic controllers and pilots are _____ to undergo a medical check-up every two years.
- 4 The officials told the airline that they _____ to improve their current safety record immediately.
- 5 Commercial pilots are told to _____ flying through military-controlled airspace.
- 6 The airports agency simply can't _____ to buy a second police service unit.
- 7 The on-board CCTV cameras _____ the pilots to see if there is a problem in the cabin without leaving the cockpit.
- 8 The recent regulations _____ all passengers to carry two items of hand luggage.

3 Complete the text with the verbs in the box. Use your dictionary to help you.

adjusted allows developed display eliminate employ
features focus needed relies on simplifies utilizes

A glass cockpit is an aircraft cockpit that
(1) _____ electronic instrument displays.
(2) _____ relatively recently, glass cockpits
are highly sought-after upgrades from traditional
cockpits. Where a traditional cockpit (3) _____
numerous mechanical gauges to (4) _____
information, a glass cockpit (5) _____ several
computer displays that can be (6) _____
to display flight information as (7) _____.
This (8) _____ aircraft operation and navigation
and (9) _____ pilots to (10) _____ only on
the most pertinent information. They are also highly
popular with airline companies as they usually
(11) _____ the need to (12) _____ a
flight engineer.



ANIMALS

Section one - Wildlife on the ground

1 Match the stories A-D with the subjects.

Which one is about an animal

- 1 being transported illegally? _____
- 2 damaging an aircraft? _____
- 3 escaping inside a terminal? _____
- 4 damaging an airfield? _____

2 Work in groups. Discuss the questions below.

- 1 Do you know of any other incidents involving wildlife loose in airports? Tell the group.
- 2 What is the most common problem involving wildlife at ground level at an airport you know?

3 Scan the report below to find what the following figures refer to.

- 1 $\frac{1}{4}$ mile the aircraft's distance from O'Hare
- 2 50 lb _____
- 3 172 _____
- 4 \$233,000,000 _____
- 5 97% _____

B Cargo workers found 2,400 snakes bound for Hong Kong sent by smugglers in Thailand. Airport officials found the snakes, worth about \$75,000, in plastic bags after cargo handlers heard hissing sounds. The banded rat snake is an expensive meal in some Asian countries.

A Rabbits are damaging the runway at a Scottish airport and airport authorities are worried that the animals could make it dangerous for planes to land. Thousands of rabbits are living in tunnels beneath the airfield and holes have appeared on the runway's new surface.

C Flight crews chased a kangaroo after it escaped at Salt Lake City International Airport. Crews were unloading the kangaroo when it broke out of its cage and hopped across the concourse. During the chase, the kangaroo scratched an airport worker and tripped up and hurt its nose.

D American Airlines banned some dogs from its planes after a pit bull terrier escaped from its cage. The crew of the Boeing 757 heard sounds from the cargo hold then the plane's backup radio and some navigational equipment stopped working. When ground crew opened the cargo hold doors, they found the dog had damaged the hold's bulkhead and door and chewed through wires as thick as a garden hose.

Animals in the flight path

The Federal Aviation Administration (FAA) reported that two planes preparing to land at O'Hare International Airport aborted their landings after a pilot spotted coyotes near the runway. The flights, operated by United and American airlines, needed

to go around, but landed safely on their second attempts. The pilots were about a quarter-mile from O'Hare with their landing gear down when they were warned. The pilot of a flight landing ahead of them saw the coyotes on the grass margins and alerted controllers.

It is not unusual for coyotes to end up on runways - they're seen at O'Hare once or twice a week. Coyotes, which can weigh as much as 50 lb, can cause significant damage to aircraft. In October 2005, a 19-passenger Beechcraft 1900 turboprop hit a coyote on take-off at the Ogdensburg airport. The nose gear collapsed, and the plane skidded to a stop. It was declared a total loss, according to FAA records. The FAA said reports of planes hitting wildlife went up four times from 1,744 in 1990 to 7,136 in 2005 because there are more flights, more wildlife near airports and

more reports from pilots. In the same period, 172 people were injured and nine died in such incidents, which resulted in \$233 million in losses.

Coyotes know how live in the urban environment, and while fewer coyotes are trapped, more are coming closer to cities to hunt rabbits and birds. The coyotes can be detected by sensors and CCTV and then often need scaring away by airport security workers in cars. But the best way to keep coyotes away is to make sure that the airport's perimeter fences are secure so they can't dig under them.

Airplanes struck wildlife 66,392 times in the USA from 1990 to 2005. More than 97% of those incidents involved birds. Strikes involving other animals were: deer - 652; coyotes - 198; alligators - 14; house cats - 11.





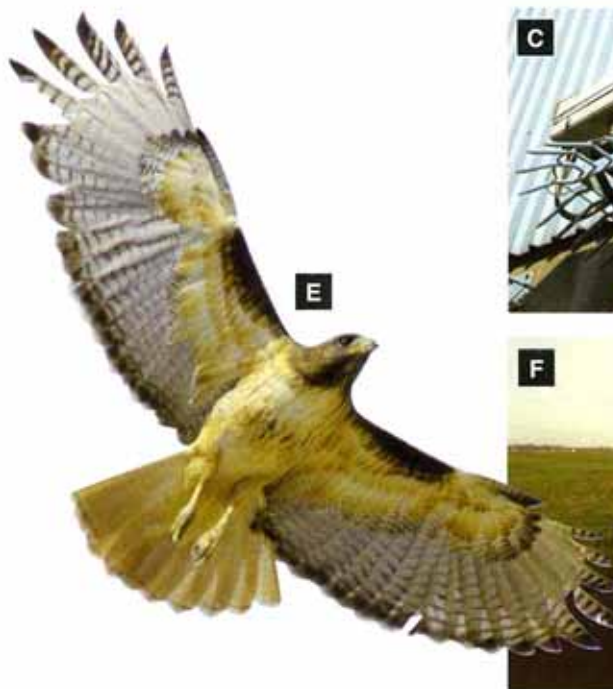
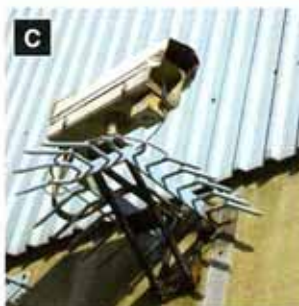
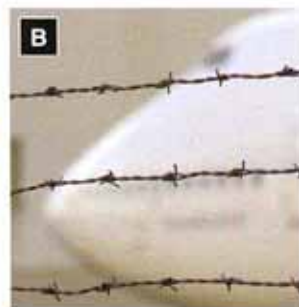
4 Read the text again and decide if the sentences are true or false. Write *T* or *F*.

- 1 Pilots were warned about the animals 15 minutes before landing at O'Hare. _____
- 2 A Beechcraft 1900 arriving at Ogdensburg airport collided with a coyote. _____
- 3 Wildlife strikes went up 80% between 1990 and 2005. _____
- 4 Airport workers drive at coyotes to scare them away. _____
- 5 Wildlife strikes in the USA included some pets. _____

Vocabulary – Security measures

Match the words with the features a-h.

- 1 perimeter fence _____
- 2 CCTV camera _____
- 3 grass margin _____
- 4 bird scarer _____
- 5 security worker _____
- 6 bird of prey _____
- 7 poison _____



Functional English – Expressing necessity

1 Look back at the text and complete these sentences.

- 1 The flights _____ around.
- 2 The coyotes ... often _____ away by airport workers in cars.

We use *need* + *to* verb to say when it is necessary to do something. We can use *need* + verb *-ing* to talk about how to improve or fix something without saying who will do it.

2 Work in pairs. Look at the vocabulary in the pictures and explain why each thing is necessary. Use the language from 1.

3 Work in groups. Discuss the questions.

- 1 What do pilots and ATCs need to do to prevent bird or animal strikes?
- 2 How could the airport you know best improve its prevention of wildlife strikes?

Section two - Animals on the loose



1 Match the words with the pictures.

- 1 containers _____
- 2 pallets _____
- 3 fork-lift truck _____
- 4 cage _____
- 5 hinge _____
- 6 cargo net _____

2 Work in pairs. Discuss the questions.

- 1 What animals are most often transported by air?
- 2 What problems can animals cause on cargo aircraft?

3 19 Listen to the conversation between pilot and ground crew, and answer the questions.

- 1 What's the problem?
- 2 What happens in the end?

4 19 Listen again and underline the correct information.

- 1 The flight is *inbound* / *outbound*.
- 2 The cages are in the *fore* / *aft* hold.
- 3 The ground crew are *unloading* / *loading on* the animals.
- 4 The plane is due to *take off* / *push back* at 1255 / 1305.
- 5 The pilot wants the ground crew to *have a look* / *go back* in the hold.
- 6 The *bars* / *lock* and *hinge* / *floor* of the cage broke.
- 7 The pilot wants to call *security* / *a vet*.





Functional English – Expressing preferences

- 1 Work in pairs. Try to complete these sentences from the dialogue.
 - 1 I _____ miss our slot.
 - 2 I _____ know what's going on in there before I make any decisions.
 - 3 This is what I _____ do.
 - 4 I _____ put themselves in danger.
 - 5 I _____ get some help with this.

- 2 20 Listen again and check, then listen again and repeat the sentences. Notice how *to* is pronounced.

- 3 Complete the sentences with the words in the box.

like me to repeat prefer not to do like to cut
 prefer people to speak like to give want to work
 'd rather work want us to clean prefer to be
 wants to do

- 1 I _____ for our national airline someday.
- 2 I'd _____ long-haul flights, if possible.
- 3 I'd _____ based abroad.
- 4 Do you _____ the windshield?
- 5 I'd _____ down the number of hours I work.
- 6 We wouldn't _____ advice until we know your position.
- 7 I _____ slowly and clearly.
- 8 Nobody else _____ night flights, but I enjoy them.
- 9 Would you _____ that information?
- 10 I work for a large airline, but I _____ for a smaller one.

- 4 Use these expressions to make true sentences about your current job. Then work in pairs to talk about what you have written.

I don't want to _____
 I wouldn't like to _____
 I'd rather _____
 I want someone to _____
 I'd prefer to _____
 I'd like to _____
 I'd like my employers to _____

Pronunciation – Word endings

- 21 Listen and repeat the sentences, starting with the last word. Notice how the end of one word seems to join the beginning of the next.

- 1 This is going to make us late.
- 2 We've got a problem in the hold.
- 3 What do you think we should do?

Functional English – Explaining unknown words

- 1 Here are examples from the dialogues when people explain what words mean.

The thing that holds the door onto the cage is broken.
*We've got a cargo net **for** catching him.*

Here are some more ways to describe an object. What thing are they describing?

*It's **made of** steel.*

*It's **something for moving** large quantities of goods.*

*It's **used to** transport goods overseas.*

*This **is something that helps** companies operate worldwide.*

- 2 Work in pairs. You are going to practise describing words. Student A, go to p 104, Student B, go to p 109.





Section three – Bird strike



- 1 Work in pairs. Discuss what kinds of damage a bird strike can cause.
- 2 🎧 22,23,24 Listen to the recording and decide if the sentences are true or false. Write *T* or *F*.
 - 1 The plane is hit by four birds. _____
 - 2 The crew increases power on engines two and three. _____
 - 3 They can't see through the windshield clearly after the strike. _____
 - 4 The pilot has difficulty turning left. _____
- 3 Listen again and answer the questions.
 - 1 At what height does the plane strike the birds?
 - 2 How much fuel is on board?
 - 3 Why doesn't the pilot want to land immediately?
 - 4 What actions does the pilot intend to take next?

Pronunciation – Sentence stress 2

- 1 🎧 23 Listen to a section of the dialogue again, and complete the sentences.

1 _____ strike!	6 _____ one.
2 _____ birds!	7 _____ level.
3 _____ running.	8 _____ one.
4 _____ power?	9 _____ thrust.
5 _____ left.	
- 2 🎧 23 Listen again and underline the stressed syllables.
- 3 🎧 23 Listen again and repeat the sentences.
- 4 Work in pairs. Practise the section of dialogue, until you can do it without looking at your book.



Functional English – Saying intentions

1 24 Listen to a section of the recording again and complete the dialogue.

- C** S27H. Say (1) _____.
- PNF** What are we (2) _____ to do? Go around to the left?
- PF** Yes. I don't (3) _____ to land with this much fuel on board. Turn left, dump fuel and get back down.
- PNF** We're (4) _____ make a left orbit of the airfield. S27H.
- C** S27H. Can you make right turns?
- PNF** Negative, sir. Right turns will be very hard. I'd (5) _____ to turn left.
- T** S27H. Understand you are unable to make right turns. Turn left at your (6) _____.
- PNF** Turning left, heading 340. S27H.
- PF** OK, we need to dump fuel as soon as possible.
- PNF** We (7) _____ to dump fuel to landing weight. S27H.

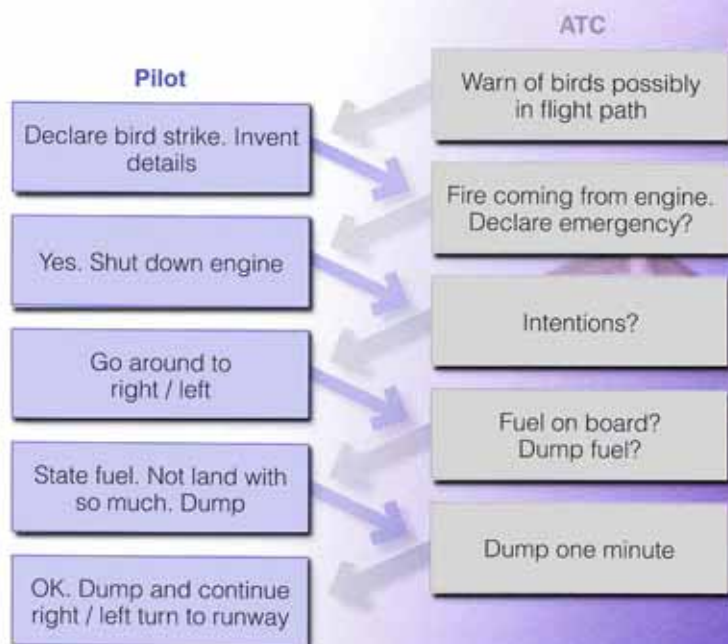
2 Complete the sentences with the words in the box.

going to are going not planning plan to you going to ask

- 1 We _____ to maintain 5,000 ft.
- 2 I intend _____ control to chase the geese off the runway.
- 3 I _____ have maintenance check the wings.
- 4 We aren't _____ dump fuel until we're nearer the airport.
- 5 I'm _____ to inform the passengers yet.
- 6 Are _____ to activate emergency services?

Speaking

Work in pairs. Student A, you are the pilot of WindAir 87. Student B, you are the ATC. Spend a few minutes thinking about what you are going to say, then act out the dialogue. Then change roles.



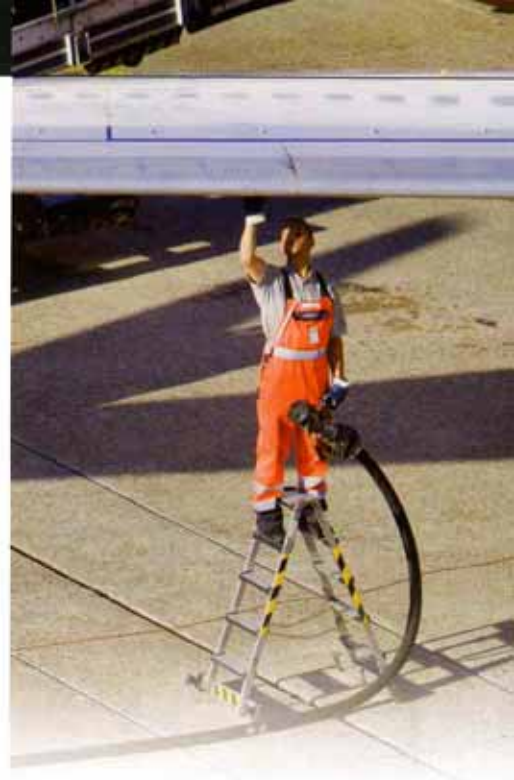


Section four – Language development

Functional English – Expressing necessity

1 Underline the correct form of the verb.

- 1 The cabin needs *to clean / cleaning*.
- 2 The controller needs *to get / getting* in contact with someone in the next sector.
- 3 The undercarriage of the Boeing 747 needs *to repair / repairing*.
- 4 We need *to change / changing* the current radio frequency.
- 5 The aircraft will need *to refuel / refuelling* on arrival at JFK.
- 6 Our technician needs *to come / coming* and fix the radar.
- 7 The landing gear needs *to check / checking* for any damage.
- 8 The emergency services need *to park / parking* near the end of the runway.
- 9 The windshield needs *to replace / replacing* as it has a big crack in it.
- 10 The trainee needs *to spend / spending* some time working in a different sector this week.



Expressing preferences

2 Express your preferences about the following things using the word in brackets.

- 1 work nights or days? (prefer)
- 2 travel on an Airbus A380 or on a Boeing 787 Dreamliner? (rather)
- 3 make voice transmissions or send text messages? (prefer)
- 4 work in a team or alone? (like)
- 5 speak English or your own language at work? (want)
- 6 fly long distances or short distances? (rather)
- 7 pilot a plane with or without passengers? (prefer)
- 8 regular hours or shifts? (not want)
- 9 deal with an unruly passenger or a sick passenger? (not like)
- 10 travel first class or economy class? (rather)

I'd prefer to work days because ...

Explaining unknown words

3 Complete descriptions 1–10 with words from the box, and match each one to an object a–j.

're made the thing	's used used for	made of used to	something for are used	something that use to
-----------------------	---------------------	--------------------	---------------------------	--------------------------

- 1 It's _____ a strong synthetic fibre and foam.
- 2 It's _____ steering the plane.
- 3 It's _____ record flight data.
- 4 It's _____ helps controllers detect and track objects.
- 5 They _____ of glass.
- 6 It's _____ detecting a possible fire.
- 7 It's _____ that cabin crew use to serve food and drinks.
- 8 It _____ to store luggage.
- 9 It's what we _____ communicate with air traffic controllers.
- 10 They _____ to help pilots and controllers to hear and speak easily.

- a control column
- b flight strip
- c headsets
- d lifejacket
- e overhead locker
- f radar
- g radio
- h smoke alarm
- i trolley
- j windshield



Saying intentions and expectations

4 Rearrange the words to create sentences expressing intentions or expectations.

- 1 assist / communication / Datalink / in / intended / is / pilots / to _____
- 2 airspace / clear / controller / plans / the / the / to _____
- 3 aim / before / dump / fuel / landing / some / to / we _____
- 4 1300 / estimate / at / ETA / hours / I / our _____
- 5 about / an / expect / hour / in / land / to / we _____
- 6 a / delay / going / I'm / inform / of / passengers / to _____
- 7 to / take / slot / off / next / we're / available / in / the / hoping _____
- 8 airline / an / company / every / has / intention / investigation / of / starting / the _____
- 9 at / depart / expected / flight / hours / is / 1800 / to / 245 _____
- 10 attendants / flight / go / intend / on / strike / the / to / tomorrow _____

Vocabulary – Security measures

1 Complete the sentences with the words from the box.

bird scarer	CCTV cameras	metal detectors	perimeter fence	poison
police unit	security worker	sensor	sniffer dog	traps

- 1 A _____ is used in airports to detect illegal items in people's luggage.
- 2 Every person boarding a flight must walk through _____.
- 3 A _____ is a piece of equipment that reacts to physical changes such as heat, light or movement.
- 4 _____ are sometimes used for catching animals near a runway.
- 5 A _____'s job is to protect a building and / or its surroundings.
- 6 A _____ is a structure made of wire that surrounds an airport for security.
- 7 _____ are placed around an airport to monitor what is happening.
- 8 A _____'s role is to frighten birds from the aerodrome airspace.
- 9 _____ is often used to kill animals or birds found near a runway.
- 10 Some airports have their own _____ to deal with any crimes on location.

Vocabulary from the unit

2 Rearrange the letters to find the synonyms of words from the unit.

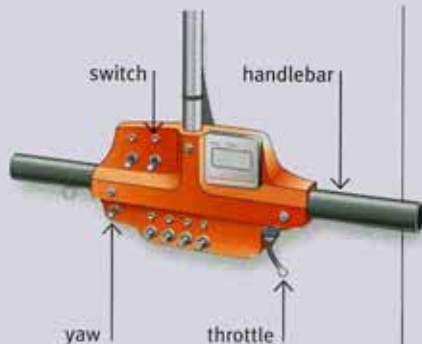
- | | |
|-------------|--------------|
| 1 eiksrt | to hit |
| 2 deijnru | hurt |
| 3 acellops | to fall |
| 4 raelt | to warn |
| 5 ehlo | crack |
| 6 beknor | out of order |
| 7 aaddegm | broken |
| 8 egiinnost | intake |
| 9 accdehrst | scraped |
| 10 rtbsu | punctured |



GRAVITY

Section one - Ultralight

- 1 Discuss in pairs. What's the smallest aircraft you have:
 - flown? • flown in? • seen?
- 2 Work in pairs. Look at the picture of the GEN-H4 and guess the answers to the questions.
 - 1 What is it?
 - a a gyrocopter
 - b a helicopter
 - c a hang-glider
 - 2 How many blades does it have?
 - 3 How is it powered?
 - 4 How fast can it fly?
 - 5 How is it controlled?
 - 6 Do you need to be a licensed pilot to fly it?
 - 7 How long does it take to assemble it?
- 3 Read the article from *Kitplane Monthly* magazine and compare your answers with the text.



The GEN-H4 is the smallest co-axial one-man helicopter in the world. It is equipped with miniature engines of 125 cc (8 HP) and two rotors, each with two blades. It can fly up to a maximum altitude of 1,000 m at a top speed of 90 km/h (59 mph) for up to 30 minutes. The rotors have a length of only 4 m (118 inches), so no parking problems.

The pilot controls the **pitch**, **roll** and **yaw** of the craft by means of a handlebar, using weight-shift to change direction. Pushing the throttle controls **climb**. As you add rpm, the fixed-pitch blades provide more **lift**. To move forward, you pull the handlebar toward you. You turn left or right by flicking a yaw switch with your left thumb, which changes the rotation of the two upper blades.

I first saw the GEN-H4 flying at the Newham Air Show, and it was impressive in action. The pilot climbed to about 100 ft, rolled to the

right and performed a wide **turn**. He then straightened up and alternated pitching up and down. Sensibly there were no steep **dive**s, but a controlled descent to just above the ground. After a further series of flight manoeuvres, he hovered above the runway before throttling back and **sinking** gently to the ground.

Because it falls into the ultralight category, you don't need to be a licensed pilot to fly this machine. Training is not a lengthy process, but you will need several sets of spare rotor blades. One pilot said that when he was teaching himself to fly he went through four sets of blades before he learned to control the helicopter without **tipping over**.

There are no worldwide standard definitions for ultralight aircraft. So make sure you check the regulations in your own country before you buy. The GEN-H4 comes in kit form and can be assembled in 40 hours.



Functional English – Explaining how something works

- 1 Try to remember the missing words in these sentences from the article, then look back and check.

- 1 The pilot controls the pitch, roll and yaw of the craft _____ a handlebar, _____ weight-shift to change direction.
- 2 _____ the throttle controls climb.
- 3 You turn left or right _____ a yaw switch with your left thumb.

- 2 Complete these sentences about basic control of a fixed-wing aircraft using the words in the box.

adjust changes	by means of controls	by means of lowering	by moving move	by moving moving	by raising pushing	turns
-------------------	-------------------------	-------------------------	-------------------	---------------------	-----------------------	-------

- 1 Cockpit controls _____ the control surfaces _____ rods, cables and pulleys.
- 2 _____ the control yoke left or right _____ roll.
- 3 You control the rudder _____ pedals.
- 4 You _____ the pitch _____ the control column backwards or forwards.
- 5 _____ the left-hand pedal _____ the aircraft to the right.
- 6 The pilot _____ the pitch of the aircraft _____ or _____ the elevators.

Vocabulary – Manoeuvring an aircraft

- 1 Work in pairs. Look at each of the **bold** words in the text (*pitch*, *roll*, etc.) and use your hands to demonstrate them.
- 2 Take turns to answer the questions about the GEN-H4. Listen to your partner's answers and say if you agree.
 - 1 What do you do by increasing the revs?
 - 2 How do you turn left?
 - 3 What happens when you throttle back?
 - 4 How do you roll right?
 - 5 What happens if you shift your weight too quickly when taking off?
 - 6 How do you adjust the pitch of the aircraft?
 - 7 What do you do by keeping the throttle open and not shifting your weight?
 - 8 How do you land?
- 3 Tell your partner about the most unusual aircraft you've ever flown, or the most unusual vehicle you've ever driven or ridden in. How were its controls unusual?

Speaking

Work in small groups. Discuss the questions.

- 1 What are the regulations for ultralights in your country? Is it legal to fly a GEN-H4?
- 2 Should pilots have to be qualified before they are allowed to use ultralights?
- 3 What are the advantages and disadvantages of fixed wing aircraft compared to rotary wing aircraft?
- 4 Would you like to fly a GEN H4? Why / Why not?



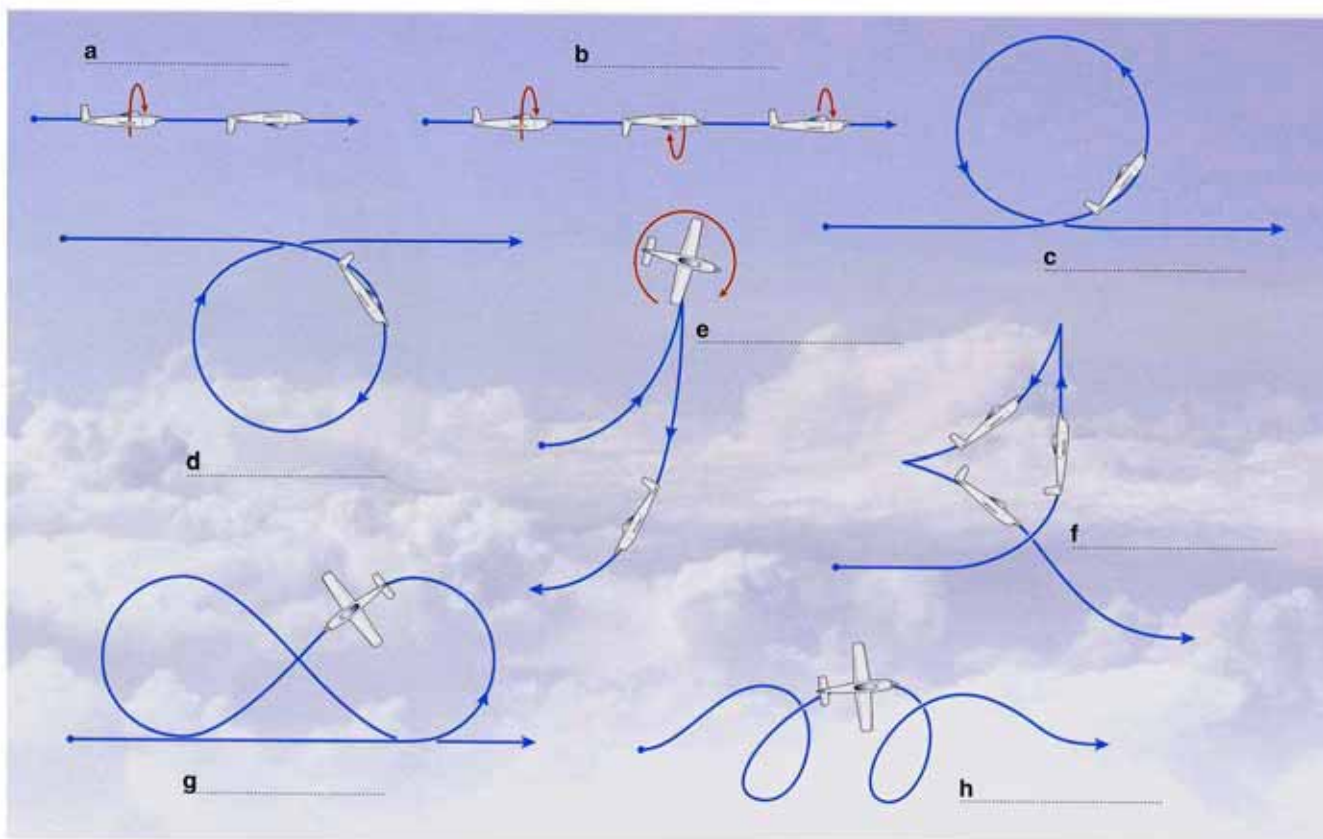


Section two – Air race

1 Work in small groups. Discuss the questions.

- 1 What do you know about the Red Bull air race?
- 2 How are the racing aircraft different from conventional aircraft?
- 3 Describe the most amazing aerobatic manoeuvres you have seen (not necessarily in an air race).

2 25 Listen to a radio interview with Brazilian world champion pilot Thiago Silvo Corbera. Number the manoeuvres 1–8 in the order he describes them.



3 25 Listen again and write the names of the manoeuvres he describes next to the pictures. The words you need are in the box (two words are not needed).

inside half barrel full outside death tail Cuban hammerhead slide loop spin roll eight

4 25 Listen again and answer the questions.

- 1 Which is Thiago's favourite manoeuvre?
- 2 Which is more important in an air race – speed or manoeuvres?
- 3 What plane is Thiago flying?
- 4 How much does Thiago's plane weigh?
- 5 How many degrees do the control surfaces deflect as a minimum?
- 6 What happened to Thiago in the 2007 race?
- 7 How is Thiago feeling about today's race?



Vocabulary – Units of measurement

- 1 🎧 26 Work in pairs. Discuss how you say these units of measurement. Then listen and repeat.

ft m ft² km f/m %/s kt
gs nm m² lb kg HP m/m

- 2 🎧 27 Listen and complete the table with the specifications of Thiago's aircraft.

- 3 🎧 28 Discuss with your partner how to say these numbers in plain English. Then listen and repeat.

- 1 6.51
2 651
3 6,501

specifications	Extra 300s	
	non-metric	metric
length	ft	m
height	—	—
weight (unladen)	—	—
wing area	—	—
g-rating	+/-	—
engine	—	—
max. speed / VNE	—	—
stall speed / VS	—	—
climb rate	—	—
roll rate	—	—
range	—	—

Speaking

You are going to exchange information about two more racing planes. Student A go to p 105. Student B go to p 109.

Functional English – Comparing and contrasting

- 1 Work in pairs. Discuss what the missing word is in each sentence.

- The CAP 232 is longer _____ the MX2.
- The Extra 300s is _____ longest.
- The CAP 232 is a _____ heavier than the MX2.
- The MX2 is the _____ powerful.
- The Extra 300s's range isn't as great _____ the MX2's.

- 2 Write two sentences comparing the racing planes using each of the adjectives in the box.

heavy powerful tall fast

- 3 Work in pairs. Discuss the questions. Try to use expressions from 1.

- In your opinion, what plane has revolutionized air travel? How is / was it different from other planes?
- What is your favourite type of plane? Why?
- What is your favourite airport? Why?



Section three – Hydraulic loss

1 Work in small groups. Discuss the questions.

- 1 What problems can hydraulic failure cause for?
 - a airborne aircraft?
 - b air traffic control?
- 2 Is hydraulic failure common? Why / Why not?
- 3 Do you know of any incidents or accidents related to hydraulic problems?
- 4 Make a list of the parts of an aircraft that can be affected by hydraulic failure.

2 29 Listen to the first part of a conversation between a pilot and an approach controller. Does the pilot mention any of the parts you listed?

3 Underline the correct words to complete the controller's summary of the situation.

Executive 56 has (1) *no / low* pressure in their hydraulic system. It is difficult for the crew to control the (2) *yaw / bank* and the pitch of the aircraft. They can only make (3) *small / big* turns and they are using (4) *asymmetrical thrust / the control surfaces* to turn. They would like to try and fly (5) *west / east* of the airport for a (6) *short / long* final.

4 30 Tick (✓) the things you think will happen. Add two more. Then listen and check your answers.

The crew will ...

- ☐ execute a missed approach
- ☐ be forced to ditch the aircraft in a field
- ☐ adopt landing configuration to control speed and height
- ☐ _____

The controller will ...

- ☐ give the crew vectors to the runway
- ☐ ask the pilot to switch frequency to the tower controller
- ☐ _____

5 31 Listen to the final exchange between the pilot and the controller. What happened to Executive 56 in the end?



Functional English – Expressing difficulty and offering help

32 Work in pairs. Try to remember some of the words and expressions that complete the sentences from the conversation. Then listen and complete the sentences.

- 1 We're _____ controlling the attitude.
- 2 It's _____ establish level flight.
- 3 Just tell me _____ and _____ for you.
- 4 We're _____ keep it straight and level.
- 5 _____ emergency assistance at the far end of the runway?
- 6 _____ line you up with the end of the runway right now?
- 7 We're really _____ follow a heading.
- 8 Is _____ you need?

Pronunciation – Tonic stress

- 1 32 In Unit 3 we looked at how the words that carry most meaning in a sentence are stressed. In addition, the word that the speaker thinks is the **most** important carries even stronger emphasis than the others. Listen to how the intonation rises on the word *attitude* in the sentence.

We're having trouble controlling the attitude.

- 2 32 Work in pairs. In sentences 2–8 of *Functional English*, discuss which word or part of a word you think should carry the most stress, and circle it. Then listen to the sentences again.
- 3 32 Listen and repeat the sentences. Then, with a partner, practise saying the sentences, concentrating on making your intonation rise on the most important word. Listen carefully and give feedback on your partner's pronunciation.

Speaking – Helping a pilot in difficulty

- 1 Work in pairs. For each situation, decide what things the pilot is having difficulty with, and what help the air traffic controller could offer. Then roleplay the situations, using expressions from the unit.

	pilot having difficulty with	help offered by ATC
1 A light aircraft has landed in marginal weather and skidded off the runway onto the field.		
2 A helicopter has total hydraulic failure.		

- 2 Change partners and roleplay the situations again.



Section four – Language development

Functional English – Explaining how something works

1 Underline the correct option.

- 1 A pilot is able to steer a plane *by means of* / *by* flight controls.
- 2 Controllers are able to observe the progress of a flight *through* / *with the use of* radar.
- 3 The second level in the Airbus A380 is accessed *by the way of* / *by way of* a curving set of stairs.
- 4 Pilots keep unwanted passengers out of the cockpit *by* / *with the use of* locking the door.
- 5 The Boeing 747 is powered *by way of* / *by* four engines.
- 6 *With the help of* / *By* an escape chute, passengers and crew are able to evacuate the aircraft quickly.
- 7 Flight safety is maintained *through* / *using* regular maintenance checks.
- 8 Aerodrome controllers are able to see aircraft clearly *by way of* / *with the help of* binoculars.
- 9 You climb and descend *using* / *through* the throttle controls.
- 10 The presence of ice on aircraft wings is reduced *through* / *by means of* de-icing chemicals.

Comparing and contrasting

small → smaller easy → easier important → more important far → farther / further

2 Change adjectives 1–10 to comparatives.

- | | |
|-----------------|-------------------|
| 1 bad → _____ | 6 short → _____ |
| 2 quick → _____ | 7 windy → _____ |
| 3 fast → _____ | 8 serious → _____ |
| 4 good → _____ | 9 tall → _____ |
| 5 busy → _____ | 10 urgent → _____ |

3 Complete the sentences using the words in the box. Not all the words are needed.

a bit a lot more as good as many farther than fewer
longer than more most important much heavier powerful as

- 1 Steel is _____ than aluminium.
- 2 The Airbus A320 is as _____ the Boeing 747.
- 3 An Airbus A380 is _____ Concorde.
- 4 French ATCs are _____ as controllers in Germany.
- 5 The _____ function of an air traffic controller is to ensure the safe separation of air traffic.
- 6 The Airbus A320 can carry _____ passengers as the Boeing 747.
- 7 A jumbo jet is able to fly _____ a light aircraft.
- 8 Captain Emery flew _____ miles than Captain Roberts last year.

4 Complete the sentences by putting the adjective in the comparative form.

- 1 Heathrow is much _____ (busy) than London's other airports.
- 2 They are making the airport _____ (big) to accommodate increased traffic.
- 3 Air travel was a lot _____ (expensive) a few years ago.
- 4 Air traffic control systems are getting _____ (safe) all the time.
- 5 Modern planes are _____ (fuel-efficient) than planes thirty years ago.
- 6 The flight was _____ (long) than usual because there was a strong headwind.



Expressing difficulty and offering assistance

5 Rearrange the words to make complete sentences.

- 1 having / I'm / is / pilot / saying / the / trouble / understanding / what _____
- 2 background / because / difficult / hear / it's / noise / of / the / to / you _____
- 3 control / fighting / plane / the / to / we're _____
- 4 air / in / increase / keep / struggling / with / the / they're / to / traffic / up _____
- 5 assistance / you / emergency / like / would ? _____
- 6 anything / is / need / else / there / you ? _____
- 7 and / for / get / I'll / it / need / me / tell / what / you / you _____

Vocabulary – Manoeuvring an aircraft

1 Match the beginnings with the endings to make sentences.

- | | |
|--|-----------------------------------|
| 1 The pilot flew inside a loop and ... | a forward on the stick |
| 2 He did a full roll ... | b the helipad before landing. |
| 3 And then they yaw ... | c the throttle controls to climb. |
| 4 They lost control and started to ... | d pitched up into a circle. |
| 5 Aerobatic manoeuvres involve ... | e several hundred feet. |
| 6 You start a dive by pushing ... | f tipping over. |
| 7 They increased power and climbed ... | g by rotating 360°. |
| 8 He eventually learnt to control the helicopter without ... | h 180° to a nose-down. |
| 9 In a GEN-H4 you twist ... | i lose altitude. |
| 10 The helicopter hovered above ... | j a lot of training and skill. |

Vocabulary from the unit

2 Rearrange the letters in the words from the unit to complete the definitions.

- 1 An aeroplane is a **defix-ginw** aircraft. _____
- 2 A helicopter is an example of **aorrtv-igwn** aircraft. _____
- 3 A **gahn-edgilr** is a simple aircraft with no engine that you lie underneath and control by shifting your weight. _____
- 4 A **lergid** is a light plane with no engine. _____
- 5 A **wto ckrtu** or tug is a vehicle used to taxi aircraft. _____
- 6 If something is **aegikln**, liquid or gas is coming out of it through a hole. _____

Section one – Is there a doctor on board?

1 Label the first-aid kit with the words from the box.

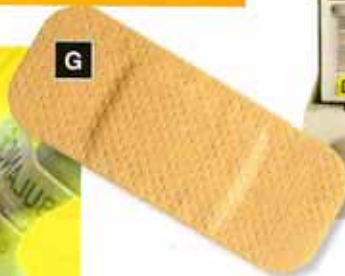
bandage _____ defibrillator _____ EpiPen _____ Inhaler _____
 plaster _____ insulin pen _____ splint _____

2 Match each of the events or injuries with the item of medical equipment that treats it.

- | | |
|------------------------------|-------|
| 1 a severe allergic reaction | _____ |
| 2 a diabetic episode | _____ |
| 3 a cut | _____ |
| 4 a limb fracture | _____ |
| 5 a severe asthma attack | _____ |
| 6 a serious head injury | _____ |
| 7 a heart attack | _____ |

3 Read the article. Match the sections A–E to events 1–7. Some sections may match more than one event.

A _____ B _____ C _____ D _____ E _____



Is there a doctor on board?

A You're midway through a routine flight, when suddenly a passenger collapses clutching his chest and struggling to breathe. This is one of the situations that cabin crew are trained to deal with, and aircraft are equipped for. So what are some of the most common medical emergencies?

This event – a heart attack – is the leading cause of in-flight death, and the leading medical cause of diversions. Medical kits include aspirin and a vasodilator spray to keep the blood flowing when there is chest pain. In case of **cardiac arrest**, cabin crew are

trained to give CPR, while many airlines now also carry defibrillators to restart the heart. **Cardiac monitors** are used increasingly, so that data can be transmitted to medical advisors on the ground.

B A large number of diversions are caused by injuries to passengers. Items falling from the overhead storage bins are a common cause of head injury, while unexpected turbulence can easily result in broken bones. **First-aid kits** are equipped with splints and bandages to stabilize **limbs**, as well as plasters for minor cuts.

C Asthma is a common condition that can be life-threatening, especially when the sufferer's inhaler is in the baggage hold. In addition to oxygen, bronchodilators and adrenaline are kept in order to open up the **airways**.

D Dangerous breathing problems can also result from severe allergic reaction, which worries airlines so much that some no longer serve peanuts. Most carry EpiPens, as well as antihistamine and adrenaline to prevent **anaphylactic shock**.

E Most medical kits contain glucose and glucagon **injections** to treat passengers who suffer hypoglycaemic **episodes**. The disruption of regular eating habits can lead to a dangerous drop in blood sugar levels.



- 4 Read the article again and answer the questions.
- 1 What event causes most deaths on board planes?
 - 2 What are the two main causes of injury?
 - 3 When can asthma be especially dangerous on flights?
 - 4 What have some airlines done to prevent dangerous allergic reactions?
 - 5 Why do diabetics sometimes have problems when flying?
- 5 Work in pairs. Discuss the questions.
- 1 Have you received training to deal with medical emergencies? What were the most important things you learned?
 - 2 Have you ever witnessed a medical emergency in your job? What happened?

Functional English – Expressing cause and effect

Try to remember the words and expressions from the article, then look back to check.

- 1 This is the _____ of in-flight death.
- 2 A large number of diversions are _____ injuries to passengers.
- 3 Unexpected turbulence can easily _____ broken bones.
- 4 Dangerous breathing problems can also _____ severe allergic reaction.
- 5 The disruption of regular eating habits can _____ a dangerous drop in blood sugar levels.

Vocabulary – Medical emergencies

Match the words in **bold** in the text with a definition below.

- | | |
|--|-------|
| 1 the tubes in the body that we breathe through | _____ |
| 2 a sudden attack of an illness | _____ |
| 3 a box containing emergency medical supplies | _____ |
| 4 the arms and legs | _____ |
| 5 a machine for checking how well the heart is working | _____ |
| 6 a sudden and extremely dangerous allergic reaction | _____ |
| 7 the sudden stopping of the heart | _____ |
| 8 a small measure of medicine for putting into the body through a needle | _____ |

Speaking – Saving the life of your airline

- 1 Read the situation.

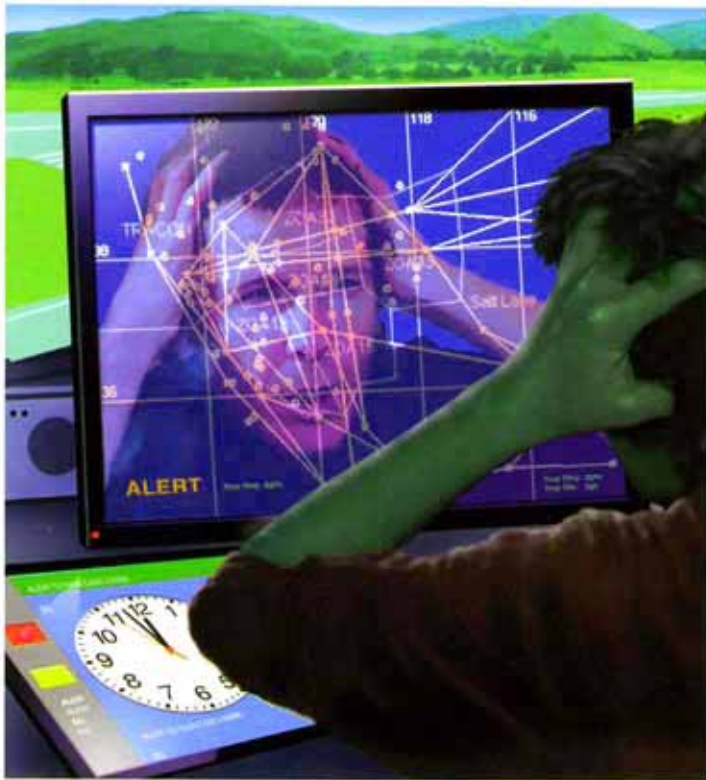
You work for a small airline which has had to make a record number of diversions due to medical emergencies in the past year. As a result, it is in serious financial trouble, and it must avoid any more diversions. It has offered a prize for the best suggestions to help it achieve this.

Work in pairs. Think of five inexpensive measures it can take to achieve this. Write down your ideas as five action points. Be creative!

- 2 Share your ideas with the group. Vote on the five most original.



Section two - Stressed?



1 Match the adjectives with their definitions.

- | | |
|--------------|---|
| 1 run down | a extremely tired |
| 2 stressed | b a bit depressed |
| 3 overworked | c feeling under pressure |
| 4 exhausted | d anxious about something |
| 5 worried | e having to work more than you are able to |
| 6 irritable | f unable to concentrate |
| 7 down | g unhealthy because of too little sleep and too much work |
| 8 unfocused | h easily annoyed |

2 Choose three of the adjectives. Tell your partner about the last time your work made you feel like that.

3 Make a list of things that can cause someone stress in their life.

4 🎧 33 Listen to part of a workshop on 'Dealing with stress', and tick (✓) the reasons you listed that are mentioned.

5 🎧 33 Listen again and note down the ways for dealing with stress that people suggest.

6 Work in pairs. Discuss the questions.

- Does stress often affect people in your job? Why / Why not?
- What tells you that a colleague is becoming stressed?
- What can an employer do to reduce stress in its employees?

Functional English – Making suggestions and giving advice

1 🎧 33 Work in pairs. Try and remember the words and expressions from the workshop. Then listen again and check.

- _____ identify the sources of stress.
- Some experts _____ keeping a diary ...
- You _____ try and take holidays from work regularly ...
- I think _____ to talk to a friend about your problems and feelings.
- ... you _____ get professional help on how to deal with it.
- For me, the _____ dealing with stress is to make sure you exercise, eat and sleep well.
- And if you can't sleep at all, well, then _____ see your doctor.
- _____ is to try and make more time for those things you enjoy.
- I _____ a stressed friend or colleague to try some stress-reducing techniques ...

2 Complete these sentences giving advice about minimizing the effects of jet lag using the words in the box.

advise can help may want shouldn't suggest suggest try and

- You _____ take a nap when you arrive.
- I _____ you drink plenty of water before, during and after the flight.
- It _____ to take a melatonin supplement when you arrive.
- You _____ to keep to your home schedule on a short trip.
- I _____ scheduling important meetings to times that correspond to waking times at home.
- _____ avoid light at times when it would be dark at home.
- I would _____ you to avoid heavy meals at a time when you would have a light meal at home.



Pronunciation – Consonant clusters 1

- 1 🎧 34 Words beginning with more than one consonant can cause misunderstandings. Listen and repeat these words from the workshop.

stress pressure spending flaps flight breakdown specific plans

- 2 🎧 35 Rearrange the words to form sentences. Then listen and check your answers. Practise saying the sentences with the recording.

1 still / we're / to / get / slot / a / struggling

2 light / brake / the / blinking / is

3 enough / drive / on / to / is / runway / the / dry ?

4 need / are / frozen / and / flaps / freeing / the

5 the / wipe / grease / the / I'll / glass / off

6 tried / to / I've / the / fixed / twice / trouble

7 threat / country / throughout / of / there's / strikes / a / the



Speaking – Giving advice

- 1 Work with a partner who does the same job as you. As an experienced worker, you have been asked to prepare a short talk on 'Minimizing stress' for people just starting their career. Identify the times when they can expect to feel stressed, and prepare a number of tips to help them deal with this.
- 2 Form small groups. Give your talk to the group.



Section three – Medical emergency

1 36 Listen to the dialogue and answer the questions.

- 1 Who do the flight crew contact and speak to?
- 2 Why do they speak to these people?
- 3 What activity caused the passenger's illness?

2 36 Listen again and underline the correct information.

- 1 The sick passenger is *Belgian / Egyptian*.
- 2 The flight is *on its way to / departing from* Egypt.
- 3 The sick passenger is about *19 / 29* years old.
- 4 The sick passenger is sitting at the *front / back* of the plane.
- 5 He has been on *holiday / a business trip* for *five / ten* days.
- 6 The flight's planned destination is *France / somewhere on the Red Sea*.
- 7 The flight has been airborne for *50 / 15* minutes.
- 8 The medical advisor tells the captain to *return to the airport / descend immediately*.

3 36 What are the passenger's symptoms? Listen again and tick (✓) the symptoms you hear.

- | | | | |
|--|-----------------------------------|------------------------------------|---|
| <input type="checkbox"/> trouble breathing | <input type="checkbox"/> shaking | <input type="checkbox"/> very pale | <input type="checkbox"/> in great pain |
| <input type="checkbox"/> coughing blood | <input type="checkbox"/> sweating | <input type="checkbox"/> vomiting | <input type="checkbox"/> losing consciousness |

Functional English – Giving and asking for updates

1 37 The crew update the medical advisor with the latest news of the situation. Work in pairs. Try to remember the missing words, then listen and check.

- 1 We _____ moved the other passengers away.
- 2 _____ removed his seat belt?
- 3 We _____ found anything else _____.
- 4 _____ eaten or drunk anything?
- 5 I _____ looked in his hand luggage.

2 Discuss the questions.

- 1 What tense is used in these sentences.
- 2 How is it formed?

3 Complete the dialogue using the expressions in the box.

've already done has fallen 's cut haven't taken it yet 's lost hasn't stopped yet 's just regained

Captain A laptop (1) _____ on an elderly female passenger.
She (2) _____ her head very badly. She (3) _____ consciousness.

Medical advisor Has the bleeding stopped?

Captain No, it (4) _____.

Medical advisor You need to put a bandage on it.

Captain We (5) _____ that. It's still bleeding though.

Medical advisor How's her pulse?

Captain We (6) _____. Ah – she (7) _____ consciousness.

Medical advisor That's good. You can give her oxygen if necessary.



Pronunciation – Intonation of lists

- 1 🎧 38 Listen to the sentence from the dialogue and notice the intonation.

He's having difficulty [↗]breathing, he's [↗]shaking badly and his eyes [↗]are shut.

- 2 Draw an arrow [↗] or [↘] to show where the intonation rises and falls in the following lists.

- 1 Nausea, dizziness, losing consciousness and sweating.
- 2 She's trembling, coughing and crying.
- 3 Lie the passenger down, put him in recovery position and call MedLink.

- 3 🎧 39 Listen and check your answers, then listen and repeat.

Speaking

- 1 Work in pairs. For each of the medical problems below, share your knowledge to write a list of three symptoms you would expect someone to have. Then, write a list of actions that should be taken to help the person.

condition	symptoms	actions
heart attack		
hypoglycaemic episode		
fractured arm		
severe allergic reaction		

- 2 Change partners. Roleplay the situations, inventing details where necessary. Take turns to be the captain and the medical advisor.





Section four – Language development

Functional English – Expressing cause and effect

1 Complete sentences 1–10 with the prepositions from the box.

from in by of to

- 1 An epileptic fit is caused _____ a sudden burst of excess electrical activity in the brain.
- 2 Excessive alcohol consumption is the leading cause _____ air rage.
- 3 Poor judgement by the pilot almost resulted _____ a fatal incident.
- 4 Several flights have been diverted as a result _____ storms.
- 5 For controllers and pilots, lack of sleep can lead _____ errors.
- 6 Aviation accidents are often caused _____ human error.
- 7 Better training for flight crew resulted _____ fewer passenger fatalities.
- 8 The leading cause _____ flight delays is poor air traffic management.
- 9 Better flight safety has resulted _____ improvements in technology.



Making suggestions and giving advice

2 Underline the correct option.

- 1 You won't be able to board the plane, sir. Please try *to calm down* / *calming down*.
- 2 You should *take* / *taking* a thick coat and a hat, because Moscow is cold!
- 3 She was advised *to go* / *going* to passport control immediately.
- 4 Due to the reported severe turbulence, they suggested *to follow* / *following* a revised flight path.
- 5 To avoid deep vein thrombosis, it can help *to walk* / *walking* around the cabin during the flight.
- 6 The passenger had a very bad headache, so the flight attendant suggested *take* / *taking* an aspirin.
- 7 It's a good idea *to go* / *going* through the passenger's belongings to see if they are taking any medication.
- 8 A good way of *stabilize* / *stabilizing* a broken limb is to use a splint.
- 9 You may want *to move* / *moving* the patient to the rear of the plane, away from the other passengers.
- 10 Try *giving* / *to give* the passenger an aspirin – that may relieve his chest pain.

Giving and asking for updates

3 Rearrange the words to make complete sentences.

1 stopped / he / yet / has / vomiting ?

2 any / began / have / idea / symptoms / the / when / you ?

3 and / blood / fallen / has / pressure / he / his / looks / pale / very

4 already / to / I've / MedLink / spoken

5 into / I've / just / recovery / passenger / position / put / the / the

6 yet / bleeding / the / stopped / hasn't

7 and / cut / has / head / his / immediately / needs / passenger / the / treating

8 has / consciousness / the / regained / just / passenger



Vocabulary – Medical emergencies

1 Match the emergencies 1–7 with their synonyms a–g.

- | | |
|------------------------|------------------------------------|
| 1 an allergic reaction | a a broken bone |
| 2 a diabetic episode | b early labour |
| 3 air rage | c hypoglycaemic episode |
| 4 an asthma attack | d cardiac arrest |
| 5 a fracture | e an agitated or violent passenger |
| 6 premature childbirth | f breathing problems |
| 7 a heart attack | g anaphylactic shock |

2 Complete the sentences with an item from each box.

give open up **stabilize** inject struggling go restart

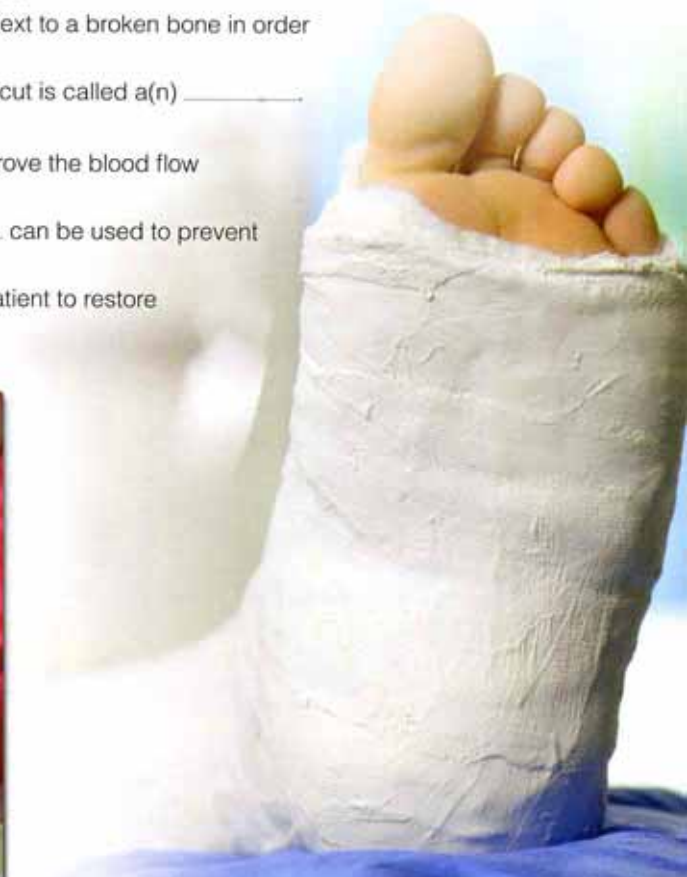
airways labour **limb** CPR breathe insulin heart

- In the case of a broken leg, the first thing to do is **stabilize** the **limb**.
- Women in late pregnancy are discouraged from flying in case they _____ into _____.
- Diabetics have to _____ themselves with _____ to control their blood sugar levels.
- Cabin crew are trained to _____ in case of a heart attack.
- A defibrillator can be used to _____ the _____ if it stops beating.
- Asthma sufferers can carry an inhaler to _____ the _____ if they have an attack.
- An oxygen mask will help a passenger who is _____ to _____.

3 Complete the sentences 1–10 with the words from the box.

adrenaline antihistamine aspirin bandage CPR defibrillator EpiPen inhaler plaster splint

- A(n) _____ is a long thin piece of cloth that you wrap around an injured part of your body.
- Cabin crew are trained to give _____ in case of cardiac arrest.
- A(n) _____ is a piece of metal, plastic, or wood that is put next to a broken bone in order to hold it in place.
- A thin piece of cloth or plastic that sticks to your skin to cover a cut is called a(n) _____.
- A(n) _____ is often used by asthma sufferers.
- _____ is a drug that cures minor pain or that is used to improve the blood flow when a patient complains of chest pain.
- _____ and _____ are administered using an _____ can be used to prevent anaphylactic shock.
- A(n) _____ is a machine that gives an electric shock to a patient to restore normal heart rhythm.



FIRE

Section one - Fire risk

1 Work in pairs. Discuss the questions.

- 1 What do you think is the most common cause of fires on board planes?
- 2 What incidents caused by fire have you heard about?
- 3 What training have you received for dealing with fires?

2 You are going to read dangerous goods incident reports from the Australian Civil Aviation Authority. Read the stories, and match each incident with a story. Write A-H.

In which incident:

- 1 was fire started by metal touching metal? _____
- 2 did someone try to illegally ship explosive powder? _____
- 3 did the movement of the aircraft cause a fire? _____
- 4 did leakage cause a dangerous chemical reaction? _____
- 5 was a fire discovered after landing? _____
- 6 did heat from a chemical reaction start a fire? _____
- 7 did an explosion in the hold cause a plane to crash? _____
- 8 did a passenger accidentally bring a dangerous item on board? _____

DANGEROUS GOODS INCIDENTS REPORT

A On arriving at the destination, one passenger's bag had smoke coming out of it. A check by the airline revealed that a cigarette lighter had ignited and burned some of the clothing.

B An aircraft crashed due to a flammable liquid – possibly perfume – leaking in a passenger's stowed baggage. An ignition source set light to the liquid, causing an explosion.

C A courier driver arrived at a freight-forwarder's premises and asked to pick up a large crate which contained an explosive material in the form of a black powder. The owner knew it was prohibited, and was already in trouble with the police for collecting a briefcase full of fireworks from the airport two days earlier.

D Federal police were called to a baggage carousel at an international airport to check an unclaimed bag. An inspection of the contents revealed a fire extinguisher and a packet of sandwiches. It was finally discovered that a passenger had accidentally taken a taxi driver's bag from the car and didn't notice that he checked in an additional bag.

E A shipper consigned a wet-cell battery, undeclared as dangerous goods. Before consignment he emptied the acid out of the battery. But he also placed a brake cable in the same package. On arrival of the aircraft, smoke from the package set off a smoke detector because the brake cable had caused a short circuit of the terminals.

F In a cargo hangar, a container ignited. One item of cargo in the container was an oxygen generator, undeclared as dangerous goods. These devices produce oxygen by chemical reaction, which creates significant heat.

G Undeclared dangerous goods described as 'laundry products' contained a mixture of a chemical solution and corrosive solids. It was loaded on its side in the cargo compartment and the liquid leaked onto the solids, causing a very hot fire.

H While unloading baggage, ground staff noticed smoke rising from a suitcase. Investigation revealed that a quantity of matches had ignited due to vibration in the hold.

DANGER >>>> DANGER >>>>





3 Decide if the sentences are true or false. Write *T* or *F*. Then read the text again to check.

- | | |
|---|-------|
| 1 In incident A, the cigarette lighter caught fire first. | _____ |
| 2 In incident B, a spark may have set the perfume alight. | _____ |
| 3 In incident C, the courier driver had fireworks in his truck. | _____ |
| 4 In incident D, the passenger was a taxi driver. | _____ |
| 5 In incident E, the shipper hadn't taken any precautions. | _____ |
| 6 In incident F, heat from the aircraft ignited oxygen. | _____ |
| 7 In incident G, the goods were incorrectly loaded in the hold. | _____ |
| 8 In incident H, ground staff immediately knew the cause of the fire. | _____ |

Vocabulary – collocations related to fire

Match a word on the left with a word on the right to make collocations from the incident reports.

- | | |
|-------------|----------------|
| 1 cigarette | a circuit |
| 2 fire | b reaction |
| 3 corrosive | c liquid |
| 4 ignition | d extinguisher |
| 5 chemical | e solids |
| 6 smoke | f lighter |
| 7 flammable | g source |
| 8 dangerous | h material |
| 9 explosive | i goods |
| 10 short | j detector |

Functional English – Obligation, prohibition and permission

1 01 Listen to a spokeswoman from the Australian CAA commenting on the dangerous goods reports. Underline the correct information.

- Many / Not many passengers fly with dangerous goods by mistake.
- Correctly-declared goods cause hardly any / most fires.
- Airport staff should possibly be better trained in dealing with fires / dangerous goods.

2 01 Listen again and complete the sentences.

- Most passengers know what they _____ and _____ bring into an airport.
- It's obvious that you _____ bring anything explosive on board.
- Although some people still try, even when they know it's _____.
- The owner of the black powder knew he wasn't _____ transport it without declaring it as dangerous goods.
- You _____ declare dangerous goods or you are _____.
- It's difficult to understand, for example, how someone _____ chemical solutions and corrosive solids on board.



Speaking

Work in pairs. You are going to roleplay a customs official explaining rules about prohibited goods to a passenger. Student A look at p 105. Student B look at p 109.



Section two - Smoke-jumper

1 Below are some words and phrases for describing fires. Put each one into the correct column.

spread contain a fire extinguish a fire ~~set something on fire~~ ignite put out a fire
go out burn spray fire-retardant liquid smoulder catch fire explode

start	continue	stop
set something on fire		

2 Work in pairs. Look at the pictures. Tell the story. Use the words in exercise 1.



3 Work in pairs. Look at the photographs of the aerial fire service in action at the top of the page. Discuss the questions.

- 1 In what type of environment would they be needed?
- 2 How do they tackle fires from the air and on the ground?

4 02 Listen to a radio feature about an aerial fire service.
What are the jobs of the three people who talk to the radio presenter?



5 🌐 02 Listen again and underline the correct information.

- 1 This aerial fire service operates in *Mongolia / Siberia*.
- 2 Wild fires are usually caused by *natural phenomena / human activity*.
- 3 Wild fires start because *the forest is dry / people are careless*.
- 4 *Summer / Autumn* is the busiest time of year.
- 5 In order to make a safe drop, the pilot *sometimes has to make two or three circuits / must keep upwind of the fire*.
- 6 For the smoke-jumper, *extinguishing the fire / finding a way out of the forest* is the most difficult thing.

Functional English – Orders and requests

1 🌐 03 Complete the sentences from the radio feature, then listen and check.

- | | |
|--------------------------|---|
| 1 _____ your full kit. | 4 _____ us how fires are caused? |
| 2 _____ for inspection. | 5 _____ about your work on the ground? |
| 3 _____ your work to us? | 6 Jumpers, _____ talk! _____ ready ... drop zone! |

2 Work in pairs. Discuss the questions.

- 1 Which sentences sound polite? Why?
- 2 Would you use similar expressions and intonation in your language to make a polite request?

3 🌐 03 Listen again and repeat the sentences.

4 We often use *get* in place of verbs of movement in orders. Make the following polite requests into orders with *get*.

- | | |
|--|----------------------------------|
| 1 Could you exit the runway, please? | _____ <i>Get off the runway!</i> |
| 2 Would you bring me some water, please? | _____ |
| 3 Could you move away from the aircraft, please? | _____ |
| 4 Could you leave the aircraft as quickly as possible? | _____ |
| 5 Can you find a fire extinguisher, please? | _____ |
| 6 Would you put on your mask, please? | _____ |

5 Work in groups. One student make a series of orders and polite requests in the same way. Other students obey polite requests, but not orders.

Speaking

Work in pairs. Discuss the questions.

- 1 Do you have an aerial firefighting service in your country? Why / Why not?
- 2 Would you like to work in aerial firefighting operations? Why / Why not?



Section three – On-board fire

1 Complete the sentences with the verbs below.

come loose set off reset overheated trips short-circuit overloaded

- The fan has _____ – there's smoke coming from it.
- If anyone smokes in the toilet, it will _____ the smoke detector.
- This outlet is _____, so we need to unplug a couple of things.
- Some wiring has _____ and needs securing in place.
- Water has got into the wires and caused the system to _____.
- If the circuit-breaker _____, you need to _____ it.

2 Work in small groups. When a fire is discovered during a flight, is it more important to fight the fire or land the plane? Why?

3 04,05,06 Listen to intra-cockpit and radio-telephony communications from a B747 in the cruise phase of flight. Tick (✓) the things that the crew do.

- | | |
|--|--------------------------|
| put on their oxygen masks | <input type="checkbox"/> |
| inform air traffic control about the problem | <input type="checkbox"/> |
| investigate the cause of the fire | <input type="checkbox"/> |
| try to extinguish the fire | <input type="checkbox"/> |
| make an announcement to passengers | <input type="checkbox"/> |
| initiate an emergency descent | <input type="checkbox"/> |

4 04,05,06 Listen again and answer the questions.

- How do the crew first realize there is a problem?
- What does the pilot think the cause could be?
- Where is the smell coming from?
- How do they deal with the passengers who feel uncomfortable?
- What two possible causes does the cabin crew manager mention?
- What equipment does the cabin crew manager put on before investigating again?



Pronunciation – /l/ and /r/

1 07 Listen to six words. Write A or B, according to the word you hear.

- | A | B | |
|----------|--------|-----|
| 1 right | light | ___ |
| 2 fright | flight | ___ |
| 3 frame | flame | ___ |
| 4 wrong | long | ___ |
| 5 road | load | ___ |
| 6 arrive | alive | ___ |

2 07 Listen again and repeat the words.

3 Work in pairs. Take turns to read one word from each line. The person listening must say if they hear A or B.

4 Now practise these sentences.

- The right light is broken.
- We had a fright when the flight landed heavily.
- The flame came from the air frame.
- The pilot flying took a wrong turn.
- They'll transport the load by road.
- All systems must be upgraded or replaced.
- I was glad to arrive alive.
- File the report on the fire.



Functional English – Identifying and responding to problems

Complete the extracts from the dialogue with the words below. Then listen and check.

1 05

happened I'll try what overheated I'll ask problem where's tripped

PF (1) _____ was that? This isn't right.

PNF What's (2) _____?

PF Three circuit-breakers have (3) _____. They're showing a (4) _____.

PNF (5) _____ the problem?

PF In one of the washrooms. Maybe the fan (6) _____.

PNF (7) _____ the cabin crew manager to look into it.

PF (8) _____ and reset the circuit-breakers.

2 06

trouble why smoke's have to can't initiating

C I (1) _____ get back there.

PNF (2) _____ not?

C The (3) _____ too heavy.

PNF Are the passengers OK?

C People are starting to have (4) _____ breathing.

PNF We (5) _____ go down.

PF (6) _____ an emergency descent.

Speaking

- 1 The flow chart shows the pattern of communication in the two dialogues in the Functional English section. Complete the boxes with the appropriate statement. The first one has been done for you.

Say what the problem is

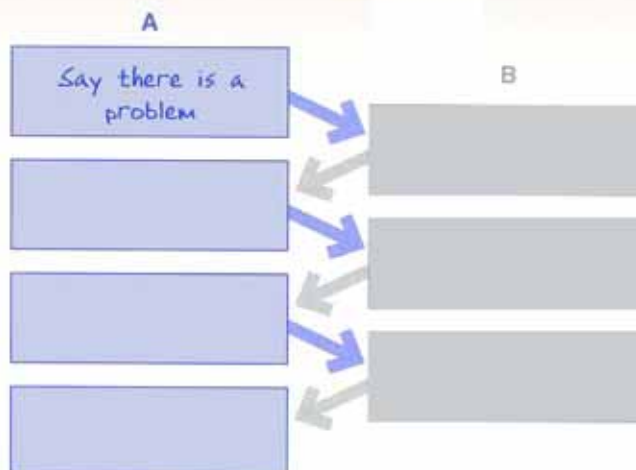
Announce action (x2)

Request clarification

~~Say there is a problem~~

Request further clarification

Give more information



- 2 Work in pairs. Use the prompts to make dialogues based on the flow chart pattern. Invent your own details.

- There is a smell of burning plastic in the galley
- The floor in business class feels hot.
- There are sparks under the instrument panel.
- There is smoke coming from a bag in an overhead locker.



Section four – Language development

Functional English – Obligation, prohibition and permission

1 Complete the sentences with the words and phrases in the box. In some cases, more than one answer is possible.

breaking the law can and can't have to illegal let
mustn't not allowed permitted prohibited required

- 1 It is _____ to smoke in the washroom.
- 2 Passengers are not _____ to enter the cockpit at any time.
- 3 You are _____ to leave your seat during take-off and landing.
- 4 Carrying anything explosive onto a plane is _____.
- 5 The cabin crew _____ inform passengers of safety procedures in the event of an accident at the beginning of every flight.
- 6 All passengers flying to and from the US are _____ to carry a machine-readable passport.
- 7 The man was not _____ on board because he appeared to be carrying suspicious goods in his hand luggage.
- 8 It is _____ to fly a plane without a license.
- 9 Hand luggage to be taken into the cabin _____ contain any dangerous or flammable items.
- 10 Flight regulations clearly state what passengers _____ bring onto a plane.

Functional English – Orders and requests

2 Rearrange the words to make orders.

- 1 immediately / fasten / passengers / seatbelts / tell / the / their / to

- 2 don't / hot / it / it's / so / touch / very

- 3 tell / severe / we / passenger / MedLink / have / and / burns / call / them / a / with

- 4 about / and / contact / emergency / problem / services / tell / the / the / them

- 5 engine / down / two / number / shut

- 6 aerodrome / inform / nearest / of / pilot / the / the

- 7 from / passengers / stop / the / the / using / washroom

- 8 as / as / get / of / out / plane / possible / quickly / the

3 Make the following orders into polite requests. Use the verbs in brackets.

- 1 Get me some water! _____ (bring)
- 2 Quick! Get a fire extinguisher! _____ (find)
- 3 Get off the runway! _____ (exit)
- 4 Get your seatbelts on! _____ (fasten)
- 5 Get on your masks! _____ (put on)
- 6 Get ATC on the radio! _____ (contact)
- 7 Find the checklist for fire! _____ (look for)
- 8 Tell me more! _____ (give)
- 9 Don't bother the pilot! _____ (disturb)
- 10 Tell me where the nearest aerodrome is. _____ (let know)



Identifying and responding to problems

4 Find and correct the mistake in each sentence.

- 1 What ~~is~~ happened?
- 2 Show me where is the problem?
- 3 What shall we doing about it?
- 4 Are OK the passengers?
- 5 I try and reset them.
- 6 I'll asking the cabin crew manager to look into it.
- 7 I'll contact ATC and declare for an emergency.
- 8 Let get the passengers' masks on.

has

Vocabulary – collocations related to fire

1 Match the beginnings with endings to make sentences.

- | | |
|---|--|
| 1 The controllers alerted the ... | a blaze at San Francisco airport. |
| 2 One of the tyres caught ... | b plastic near his seat. |
| 3 It took eleven firefighters to contain ... | c engulfed the plane just seconds after everyone had been evacuated. |
| 4 The flight attendant tried his best to extinguish ... | d the small fire in the washroom. |
| 5 The pilots could see ... | e extinguishers on every plane. |
| 6 The emergency fire service sprayed the empanage of the plane with ... | f fire on landing. |
| 7 Two fire services were involved in attempting to tackle the ... | g the fire on the runway. |
| 8 A passenger thought he could smell burning ... | h smoke coming from under the cockpit door. |
| 9 There should be several fire ... | i emergency services as soon as they realized there was a problem. |
| 10 The flames completely ... | j foam. |

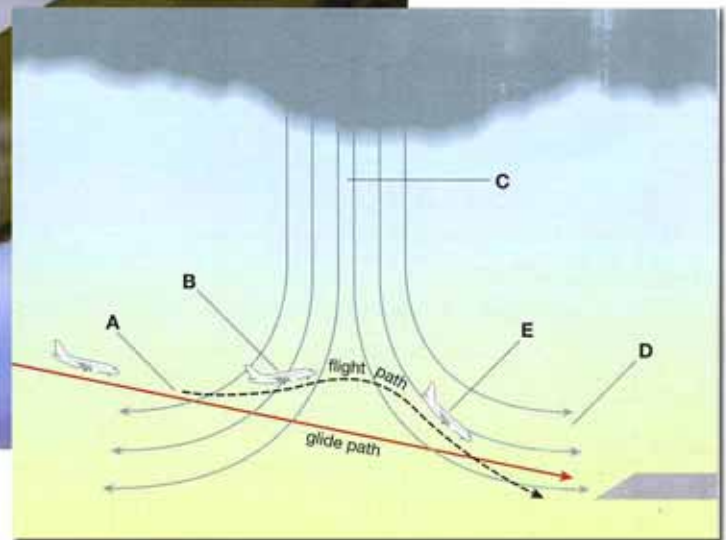
Vocabulary from the unit

2 Rearrange the letters in the words from the unit to match the definitions.

- | | |
|---------------------------|--|
| 1 adeprs | (of fire) to gradually affect a larger area |
| 2 est fof | to cause something to operate or to explode |
| 3 delmorsu | to burn slowly, producing smoke but no flames |
| 4 egiint | to start to burn, or to make something start to burn |
| 5 horst cciirtu | a bad electrical connection that prevents a piece of equipment from working |
| 6 efir gruinhetsix | a foam-filled container that is used to put out a fire |
| 7 xegnoy akms | an object that fits over your face and is used for helping you to breathe normally |
| 8 oehs | a very long tube that water can flow through |



METEOROLOGY



Section one - Microburst

1 Match the descriptions below with letters A-E in the diagram.

- 1 Tailwind increases
- 2 The aircraft has increased lift
- 3 Headwind increases
- 4 The aircraft suddenly loses lift and air speed
- 5 A downdraft of cold air

2 Read the text and decide if the sentences are true or false. Write *T* or *F*.

- 1 Flight 191 landed on a short runway.
- 2 The problem was caused by fast-moving cold air.
- 3 Ted Fujita piloted a plane through a microburst.
- 4 American pilots found a method for surviving a microburst.



Microbursts – a battle against nature

As Delta Airlines Flight 191 approached Dallas-Fort Worth airport on a hot summer's day in 1985, it flew into a thunderstorm. The storm quickly got worse, and the crew noticed that something extremely strange was beginning to happen. At 800 ft, they suddenly began to lose control of the plane's speed, which increased to 173 kt without any throttle. Just as suddenly, the speed dropped to 119 kt, even though the pilot was applying full power. To prevent a stall, the pilot pushed the nose down. The plane could not gain height, and came down far short of the runway. The freak weather that brought down Flight 191 was a microburst. Millions of dollars have been spent on pilot training and detection systems to ensure that planes can now survive this dangerous phenomenon.

A microburst is essentially a shaft of fast-moving cold air that hits the earth from high up in the atmosphere, then explodes upwards and outwards. A low-flying plane encountering this would fly first into a strong headwind, then a downdraught, then a fierce tailwind, which forces it to lose height rapidly. A microburst is caused when a thunderstorm carries massive amounts of wet warm air high into the atmosphere on its strong updraughts. This air then cools and becomes heavier, causing it to plunge to earth.

The first person to suspect the existence of this phenomenon was a researcher called Ted Fujita, who was flying over a Siberian forest in 1972 when he observed how tens of thousands of trees had been blown down in a pattern radiating outwards from a single point. He knew that the

cause could not be a massive tornado, as the crew said, because a tornado follows a path. Research into the phenomenon began, but progress was quite slow until the 80s, when research by NASA gave us an understanding of how microbursts are caused, and it was recognized that even a large aircraft could not survive them.

The survival technique that pilots are taught today was developed by two American pilots in the 1980s. The required action goes against natural instincts – apply full power and pull the nose up at least 15° until the stall warning is triggered, and then hold on through the turbulence. Without doubt, the insight and determination of the people who first recognized and studied microbursts thirty years ago has saved the lives of thousands of passengers.

3 Read the text again and answer the questions.

- 1 What effect did the microburst have on the speed of flight 191?
- 2 How did the crew try to avoid stalling the aircraft?
- 3 In your own words, how is a microburst formed?
- 4 What effects does a microburst have on a low-flying aircraft?
- 5 How did Ted Fujita know a tornado did not damage the forest?
- 6 How do pilots today deal with microbursts?

2 Underline the best adjective to complete the sentences.

- 1 It's very / absolutely freezing in winter in Siberia, and you need a fur hat.
- 2 Libya is extremely / not at all hot for most of the year, which can cause overheating problems.
- 3 It gets quite / extremely cold at night, but the temperature never falls below freezing.
- 4 You get some really / very incredible storms in the mountains.
- 5 The runway can be absolutely / pretty slippery, even after the snow is cleared.

Functional English – Changing the strength of adjectives

We can use adverbs to make an adjective weaker or stronger.

... something **extremely** strange was beginning to happen.
... progress was **quite** slow ...

Or we can use an extreme adjective.

a **massive** tornado

1 Number these words or expressions from 1 (weakest) to 6 (strongest).

- really / absolutely huge
- quite / fairly / pretty big
- huge
- very / really big
- not big at all
- extremely big

Speaking



Work in groups. Talk about the most extreme weather conditions you have experienced. Talk about:

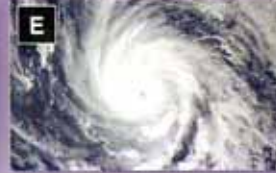
- when and where they happened
- how bad the weather was
- what happened
- what happened at the end of the story
- any developments / results of this.



Section two – Airport disruption

1 Match the words below with the pictures of weather conditions.

thunderstorm —
gale —
monsoon —
fog —
hurricane —
hailstorm —



2 Work in pairs. Discuss which weather type(s) you could find in:

- 1 a tropical area
- 2 a northern coastal area
- 3 an inland area.

3 Match the words with the definitions.

- | | |
|--------------|--|
| 1 visibility | a (of a surface) difficult to move on because it is wet or smooth |
| 2 slippery | b used to describe weather that keeps changing |
| 3 overcast | c how far you can see, depending on weather conditions |
| 4 sticky | d used to describe weather that makes you feel hot and uncomfortable |
| 5 unstable | e completely cloudy, so that you cannot see the sun |

4 08 Listen to four weather descriptions. Number the places on the map in the order you hear them.



5 08 Listen again and make notes to complete the chart.

	Bristol	Almaty	Kerala
Winter	overcast drizzle		
Summer			
Prevailing wind			
Warning			



Vocabulary – Weather words

Match the adjectives with the nouns that they describe.

good (x2) humid mild stormy (x2) rough smooth overcast clear strong light (x2) heavy poor freezing

- | | | | | | | | |
|----------------------|--------------|---|-------|---|-------|---|-------|
| 1 weather conditions | <u>humid</u> | / | _____ | / | _____ | / | _____ |
| 2 an approach | _____ | / | _____ | | | | |
| 3 the sky | _____ | / | _____ | / | _____ | | |
| 4 wind | _____ | / | _____ | / | _____ | | |
| 5 rain | _____ | / | _____ | | | | |
| 6 visibility | _____ | / | _____ | | | | |

Functional English – Results and consequences

09 Listen and complete the sentences from the listening.

- _____ of the warm Atlantic winds, the temperature remains quite high.
- Aircraft usually depart on the south-west heading _____ prevailing south-westerly winds.
- The airport operator has just resurfaced the runway, and _____ this sometimes there can be standing water.
- This _____ quite long delays as aircraft have to enter holding patterns.
- It can _____ be difficult to predict the heavy rains, and flooding can happen at any time.
- _____ consequence, pilots need to be careful just before the monsoon.

Listening – Weather forecast

1 Look at the weather forecast for Bristol. Discuss what effect the weather will have on flights into and out of Bristol over the next 12 hours. Try to use expressions from the exercise above.

2 10 Listen to a briefing from the ATC shift supervisor and underline the correct information.

- Controllers working the *approach / departure* areas are going to be busy.
- The *evening / night* shift is going to be quieter than the *evening / night* shift.
- The *upper airspace / apron* is going to be very quiet over the next 12 hours.
- It's going to be difficult for *westbound / eastbound* aircraft to fly into Bristol today.



Functional English – Asking someone to repeat information

1 11 Listen and complete the sentences.

- I _____ the word before 'control positions'.
- I _____ that last bit.
- What _____ after 'morning shift'?
- _____ the first part of the sentence?

2 Work in pairs. Take turns to read parts of listening script 08 on page 121, but occasionally whisper an important word so that your partner can't hear it. When you don't hear a word, use the expressions above to ask for repetition.

Speaking

Work in groups. Talk about the weather conditions at your airport and how your airport deals with extreme weather.



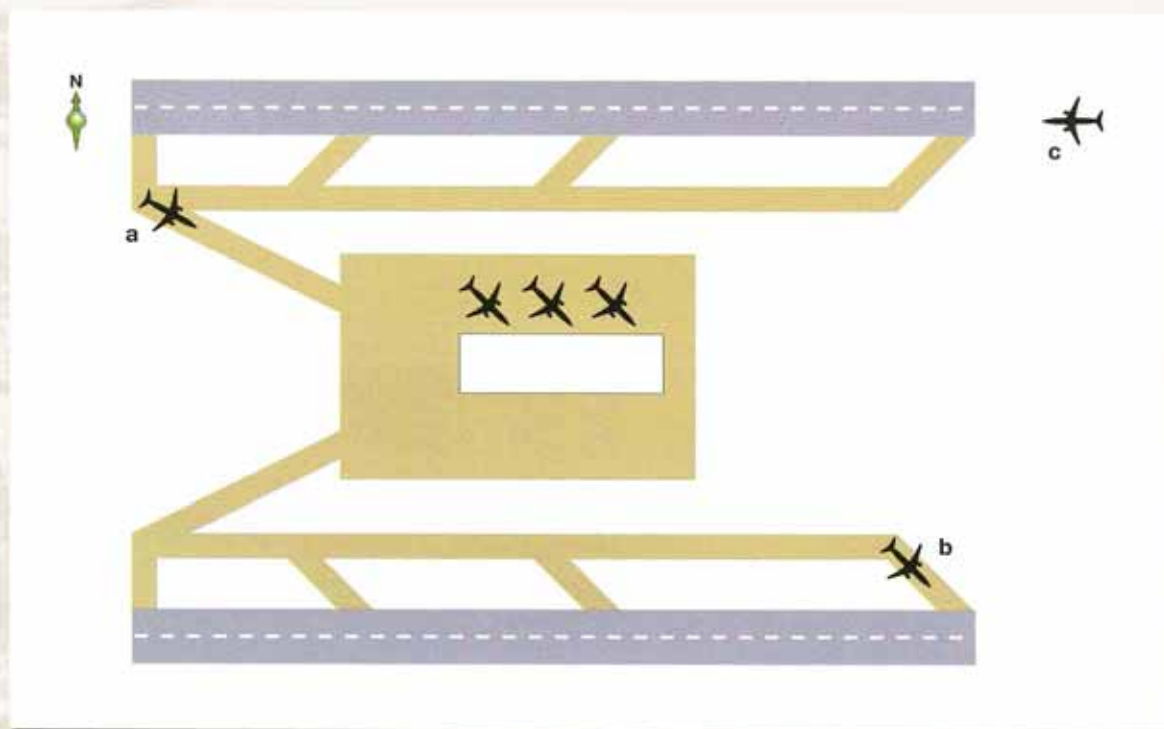
Section three – Stormy approach

1 Work in groups. Discuss the questions.

- 1 What is wind shear and why is it so dangerous for aircraft?
- 2 How can arriving and departing traffic avoid wind shear?
- 3 What experience of wind shear have you had?

2 12 Listen to the first part of the dialogue and match the call signs to aircraft A–C in the picture.

- 1 ES23 2 QA638 3 Company 737



3 12 Listen again and underline the correct information.

- 1 The pilot of ES23 decides to *cancel the flight / take off / wait*.
- 2 QA638 sees the storm is *in front of / to the left of / behind* the airport.
- 3 The crew of QA638 requests a *pilot report / weather report / new flight path* from the tower.
- 4 The crew of Company 737 describes the landing conditions as *rough / smooth / bumpy in places*.

4 13,14 Listen to the second part of the dialogue and decide if the statements are true or false. Write T or F.

- 1 The threshold wind speed is decreasing. _____
- 2 Wind direction varies between 270° and 250°. _____
- 3 Visibility is getting worse. _____
- 4 The tower controller issues a microburst alert with a speed loss of 30 kt. _____
- 5 QA638 loses 20 kt on short final. _____
- 6 The pilot decides to fly through the turbulence and land. _____

Functional English – Warnings

1 14 Listen again to a short section of the dialogue. Complete the expressions.

- 1 _____ wind shear.
- 2 _____ any microburst activity.
- 3 _____ on short final.
- 4 _____ microburst activity.

We use *be on the alert* / *watch out* / *look out (for something)* and *be careful (of something)* to warn someone about possible danger.

- 2 Work in pairs. Write a short dialogue between pilot and ATC, or pilot and co-pilot, including the four expressions above. Then perform it to the group.

Pronunciation – /ʃ/, /ʒ/, /tʃ/, /dʒ/

1 15 Listen to how we say these sounds. Listen and repeat the words.

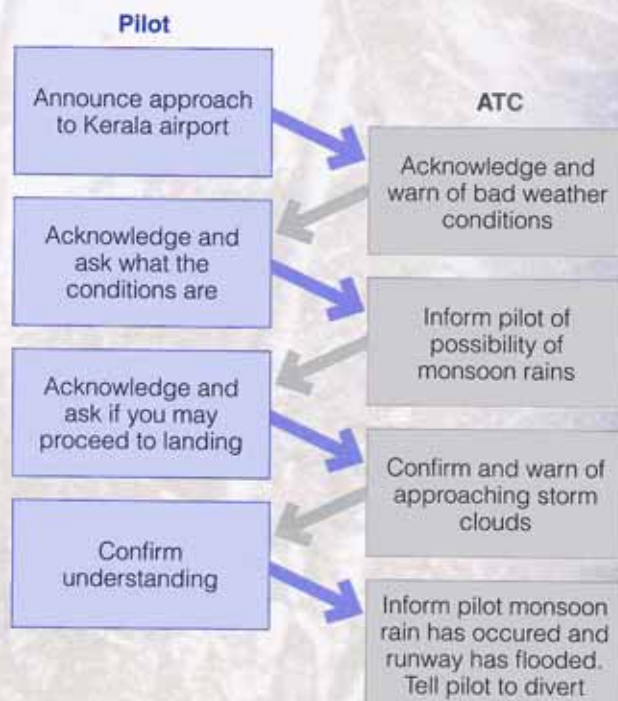
2 Put the words into the correct column in the table according to the underlined sounds.

approach	edge	measure	switch	threshold	emergency	usual	shear
/f/		/ʒ/		/tʃ/		/dʒ/	
short		visual		watch		roger	

3 16 Listen and check your answers. Then listen again and repeat the words.

Speaking

1 Work in pairs. Student A is the pilot of HotAir 220 coming to land at Kerala airport, India. Student B is the approach ATC. Read the conversation outline and decide what to say.



2 Roleplay the dialogue, then change roles and do it again.



Section four – Language development

Functional English – Changing the strength of adjectives

1 Complete the table with the correct synonyms from the box.

absolutely enormous entirely exceptionally extremely fairly huge
massive minute pretty really relatively slight tiny totally

small	big	quite	very	completely

Results and consequences

2 Match the beginnings with the endings to make sentences.

- | | |
|---|--|
| 1 There was a thunderstorm overhead, so ... | a cancelled her VFR flight. |
| 2 Because of the strong turbulence, ... | b flights were diverted to an alternative airport. |
| 3 And it is for this reason ... | c lost control of the plane. |
| 4 The runway is particularly slippery. You should therefore ... | d expect longer stopping distances. |
| 5 As a result of strong gales, ... | e of ice accretion from freezing drizzle. |
| 6 Wing stall is a common consequence ... | f passengers were told to fasten their safety belts. |
| 7 The sky was dull and overcast. The pilot consequently ... | g reduced visibility near the airport runway. |
| 8 The wind shear during the thunderstorm resulted in ... | h some very severe turbulence. |
| 9 The foggy conditions led to ... | i several hangars had to be repaired. |
| 10 One of the wings of the plane had not been de-iced and the pilot subsequently ... | j that we have decided to suspend two members of ground control. |

Asking someone to repeat information

3 Rearrange the words to make sentences.

1 catch / didn't / first / I / of / part / the / the / sentence

2 that / get / I / didn't

3 bit / can / last / repeat / that / you ?

4 after / did / 'hailstorm' / say / what / you ?

5 that / was / said / word / what / before / the / you / 'conditions'?

6 catch / didn't / I / I'm / that / sorry

Warnings

4 Underline the correct option.

- 1 *Be prepared to / Be on the alert for* wind shear when approaching the edge of the city.
- 2 *Watch out for / Pay attention* microburst activity near runway 27L.
- 3 We were told to *look out for / listen carefully* any light aircraft caught in the storm.
- 4 Please *be careful of / be ready* the slippery runway on landing.
- 5 You will need to be particularly *beware of / vigilant* when flying near the mountains.
- 6 Please *be prepared to / be on alert for* review your current flight plan because of the hurricane.
- 7 And on landing you will need to *be ready to / prepare for* a longer stopping distance due to the surface rain.
- 8 I want you to *beware of / listen carefully* as I read through the emergency procedure.
- 9 He didn't *pay attention to / on alert for* the warning about severe thunder and lightning.
- 10 *Watch out / Beware of* the strong winds at the end of the runway.

Vocabulary – Weather words

1 Match the adjectives 1–9 with their opposites a–i.

- | | |
|------------|-------------|
| 1 wet | a smooth |
| 2 warm | b darkness |
| 3 overcast | c dry |
| 4 bright | d cool |
| 5 heavy | e headwind |
| 6 freezing | f light |
| 7 rough | g scorching |
| 8 tailwind | h clear |
| 9 sunlight | i dull |



Vocabulary from the unit

2 Rearrange the letters to match the definitions.

- | | |
|--------------------|--|
| 1 abckl iec | an invisible slippery surface that can form on the runway in cold weather |
| 2 bpumy | (used about a flight) uncomfortable because of bad weather |
| 3 wde | small drops of water that form on the ground at night |
| 4 dehnrtu | the loud noise that you sometimes hear in the sky during a storm |
| 5 zdeirlz | very light rain |
| 6 osrtf | a thin white layer of powdery ice that forms on things outside when the weather is very cold |
| 7 aegl | a very strong wind |
| 8 aehilnost | a small ball of ice that falls as rain |
| 9 gghilnnt | the bright flashes of light that you see in the sky during a storm |
| 10 tesel | a mixture of snow and rain |
| 11 yeilprps | a surface that is difficult to move on because it is smooth or wet |
| 12 hissu | snow that is starting to melt on the ground |

LANDINGS

Section one – Touchdown



- 1 Work in groups. Look at the pictures. Where do you think the pictures were taken?
- 2 Make a list of the problems fixed-wing aircraft could have on approach and landing. Think about:
 - terrain
 - obstacles
 - manoeuvres
 - runway length
 - weather
- 3 Read the exchanges about difficult landings from a pilot's Internet forum and match the airports with the pictures. Do they mention any problems from your list in 1?

http://www.pilotforum.org

14th July 2008, 11.19

SUPERMAN CVF is the only place I know where you can fly a bad weather low-level circuit BELOW the control tower! In an afternoon landing in winter, the sun is so low that from turning finals at two miles to just before touchdown, it's absolutely impossible to see in front of you. You can't go around because there is a mountain in the way. On short final, the runway looks too short and it looks like you're going to hit the mountain, but because part of the runway is at a +18.5% gradient, you have to ADD power to roll out. If the aeroplane stops, you won't get to the apron without someone getting out and pushing.

14th July 2008, 14.16

JETHEAD747 The 05 instrument approach at SXM is a VOR / DME but it's usually a visual. You can't touch down later than the touchdown zone because you only have a short 7,054 ft for roll-out. Slowing down and cooling is an operational issue. We had to go around once because an aircraft's brakes overheated and seized and it got stuck on the runway. On departure you backtrack onto the runway, do a 180. Right behind the aircraft there is a fence and a beach. There are always people standing near the fence and several have been blown back into the sea by jet blast.

14th July 2008, 14.55

BULLDOG The famous HKG runway one-three procedure was incredible. The fun started once eastbound on approach. First you got the view of the city and the skyscrapers. Then the giant red and white squares on the mountainside. You extended the gear as you closed with this marker. Just as it seemed like you were going to fly into the marker, you turned hard right, banking a full 47.5°. You turned so close to the buildings that you could see the people inside. It looked as if you could reach in and change the TV channel. 30 seconds later it was rudders neutral, you flared, and the undercarriage touched down, kissing solid ground. Unforgettable!

14th July 2008, 14.55

LORD LUCAN TGU is situated in a basin between mountains, and if you land on runway 01, you circle inside the basin, below the mountaintops. You have to bank hard, and you can look the opposite way and still see trees and mountains. On final you only have 100–200 ft to line up before touchdown. 01 has a displaced threshold, leaving a limited 5,436 ft of useable pavement. There's also a 1.06° downhill slope and a cliff, which is only 100 ft from the end of the runway. It always looks as though you're going to fall off the end of the runway! It used to be even more exciting before they removed a small mountain on the approach path and added traffic lights on Boulevard Hacia Loarque to stop traffic for each arrival or departure.



- 4 Read the text again. Answer the questions. Put a tick (✓) in the table.

Which airport	CVF	SXM	HKG	TGU
has no procedure for a missed approach?				
has a problem with bright light?				
has problems with braking?				
Which airports				
have sloping runways?				
have high bank angles on approach?				
have roads near the runway threshold?				
have mountain obstacles on the approach paths?				

- 5 Can you remember what these numbers refer to?

1 47.5° 2 100 ft 3 7,054 ft 4 +18.5% 5 180° 6 100–200 ft

- 6 Work in pairs. Describe the approach and landing at an aerodrome you know well. What are the interesting features?

Vocabulary – Landing gear and braking

Decide if the words are related to arrival, departure or gear / brake problems. Write A, D or G/B next to each one.

roll out ____ rotate ____ overheat ____ extend ____ flare ____ touch down ____
lock ____ seize ____ retract ____ collapse ____ get stuck ____ line up ____

Functional English – Describing sensory impressions

- 1 Look back at the pilot's Internet forum and complete the sentences.

- On short final, the runway _____ too short and it _____ you're going to hit the mountain.
- Just as it _____ you were going to fly into the marker, you turned hard right.
- It _____ you could reach in and change the TV channel.
- It always _____ you're going to fall off the end of the runway!

- 2 Work in pairs. Student A, describe what you think is happening in the four pictures below. Try to use the expressions from 1. Student B, look at the complete pictures on p 109. Listen to Student A's ideas first, then tell them if they were correct.

Student A



- 3 Change roles. Student B look at the pictures below. Student A look at the complete pictures on p 105.

Student B



Speaking

Work in small groups. Discuss what experience you have had of landing gear or braking problems.



Section two – Letting down a VIP

- 1 What special arrangements have to be made when transporting the following VIPs in your country?

- government representatives
- members of the royal family
- celebrities

Think about:

- security
- personal / private aircraft
- media
- diplomatic clearance.

- 2 17 Listen to a helicopter pilot talking about the time he carried a VIP, and answer the questions.

- 1 From where to where did the pilot have to carry the VIP?
- 2 Who was the VIP?
- 3 What caused problems with the journey?

- 3 17 Listen again and underline the correct information.

- 1 The helicopter landed *by / behind* the house.
- 2 The journey was about *five / ten* miles.
- 3 The pilot called the ship *after / before* they were airborne.
- 4 The ship lost the helicopter on the radar $\frac{1}{4}$ / $\frac{3}{4}$ of a mile out.
- 5 The pilot went around because he *lost communication with the ship / couldn't see*.
- 6 The VIP *knew nothing about flying / was an experienced flyer*.
- 7 Flying at 100 ft above the water is *risky / not risky*.
- 8 The outline of the ship was visible at *150 / 100* ft.



Functional English – Describing 3-D position and movement

- 1 Complete the sentences from the description of the VIP's journey using the prepositions in the box.

around below over into out onto under through

- 1 We went _____ the top of the cliffs ready to let down.
- 2 The best way to get _____ ship ...
- 3 We went _____ the fog.
- 4 It's difficult to continue visually _____ fog.
- 5 I decided that we would go _____ the ship.
- 6 One of the options was to let down a little bit early to get down _____ the fog.
- 7 So I let down a little bit more, and came _____ from _____ the fog.

- 2 17 Listen again and check.

- 3 Work in pairs to describe your helicopter route to your partner. Student A go to page 106. Student B go to page 110.

- 4 Work in pairs. Describe the last flight you made or took using as many of the words from the box in 1 as you can.