

Unit 30: Aircraft Marshalling

Unit code: L/601/6487

QCF Level 2: BTEC First

Credit value: 2

Guided learning hours: 16

● Aim and purpose

The aim of this unit is to enable the learner to develop the necessary knowledge and understanding of the principles of aircraft marshalling. This will enable the learner to be able to safely marshal an aircraft onto, or off, a stand.

The knowledge provided within this unit is fundamental to all activities within the airport environment. This unit is appropriate (but not obligatory) for all learners prior to them undertaking activities as a ramp agent.

● Unit introduction

As an aircraft taxis onto its parking stand, many people will have seen a person standing in front of it in a yellow coat, furiously waving what appear to be table tennis bats in the air. While this activity may provide a moment of entertainment for the onlooker, the aircraft marshaller is actually performing a vital safety function in this crucial stage of the arrival phase.

Aircraft are designed to perform at their best when travelling at high speed, several thousand feet above the ground. Their ability to manoeuvre is severely limited when negotiating the congested taxiway and ramp network of a busy airport. Equally, the view from the cockpit can be limited; often the wing tips are very difficult for flight deck crew to see. As a consequence, some form of guidance is usually provided for the final act of aircraft parking.

Not only does the aircraft marshaller provide this guidance, they are also responsible for checking that the parking stand is suitable for accommodating the aircraft. Checks must be made to ensure there is no debris on the stand, that no vehicles have been left in dangerous locations and that boarding or disembarking passengers are not going to be endangered by the approaching aircraft.

Once the checks have been carried out, the marshaller must use clear and confident signals to guide the aircraft safely. This is not a job for the faint-hearted – standing in front of a 550-tonne A380 as it creeps towards you, following your directions, with the knowledge that the safety of the aircraft largely rests on your judgement, can be daunting. However, once familiar with the signals and responsibilities, aircraft marshalling can be one of the more rewarding job roles on the ramp. Each arrival is slightly different, each with its own challenges to overcome.

● Learning outcomes

On completion of this unit a learner should:

- 1 Understand how to prepare for aircraft arrival on stand
- 2 Be able to marshal aircraft onto and off stand.

Unit content

1 Understand how to prepare for aircraft arrival on stand

Purpose of marshalling:

- safety, e.g. to aircraft, to ground staff, to passengers
- guidance, e.g. correct stand, correct stopping point

Dangers of marshalling:

- noise
- ingestion
- blast
- vehicle collision
- dust

Foreign object debris (FOD):

- from engineering activities, e.g. tools, nuts and bolts, oil cans
- from caterers, e.g. food, cutlery, cups, bar seals
- from loading activities, e.g. wheels and studs from suitcases, handles from suitcases, lashing straps
- other, e.g. litter

Checks before bringing aircraft onto stand:

- stand unoccupied by other aircraft
- clear of equipment, e.g. tug, conveyor, bag cart, container dolley, chocks
- free of contamination, e.g. FOD, oil/fuel spill
- activities on adjacent stands, e.g. boarding/disembarking passengers, service equipment

Marshalling aids:

- manual, e.g. bats, illuminated wands, hi-vis gloves
- mechanical, e.g. aircraft parking and information system (APIS), azimuth guidance for nose-in stand (AGNIS)
- additional aids, e.g. follow-me vehicle, wing tip guide

Weather:

- fog, e.g. use of follow-me vehicle, series of marshallers, wing tip guidance
- personal precautions, e.g. in high wind, ice and snow

PPE used by marshallers:

- ear defenders
- hi-vis clothing
- weather protection
- goggles
- protective footwear

2 Be able to marshal aircraft onto and off stand

Hand signals:

- marshaller to flight deck
- flight deck to marshaller
- standard signals
- emergency signals

Rules, regulation and signals:

- Civil Aviation Publication CAP637 (Visual Signals Handbook) – Rules of the Air Regulations
- marshalling signals (this stand, straight ahead, turn left/right, stop, chocks inserted, ground power attached, clear to start engine, disconnect ground power, chocks away, cleared to depart the stand)

Actions to make an aircraft safe:

- chocks in
- engine shut down
- anti-collision beacon off
- propellers secured (if applicable)

Actions prior to departure:

- chocks in position
- steps away
- hold doors checked
- FOD check
- clear behind
- ground power unit (GPU) functioning (if required)
- engine start
- GPU unplugged
- chocks away

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
P1 Explain the purpose of aircraft marshalling	M1 Illustrate the procedures used to bring an aircraft onto and off stand safely in different weather conditions	D1 Analyse the consequences of non-compliance with regulations and safety checks when bringing an aircraft onto and off stand
P2 Describe the dangers of carrying out marshalling duties [RL]		
P3 Identify different types of Foreign Object Debris (FOD)		
P4 Describe the checks required before bringing aircraft to the stand		
P5 Identify different types of marshalling aids		
P6 Explain how weather conditions can affect the marshalling procedure [IE]		
P7 Describe Personal Protective Equipment (PPE) used in the marshalling process		
P8 Use correct hand signals to marshal aircraft onto and off stand [TW, EP]	M2 Use marshalling aids to demonstrate bringing an aircraft onto and off stand safely during set scenarios, evaluating own performance	
P9 Describe the rules, regulations and signals of marshalling an aircraft		
P10 Describe the actions required to make an aircraft safe prior to personnel approaching		
P11 Describe the actions required prior to aircraft departure		

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

Airside visits are difficult to arrange. Watching an aircraft marshaller in action is by far the best way to appreciate the skills and confidence required to perform the task. However, for most learners input is likely to take place in the classroom or even the centre's car park. There are many YouTube video clips of aircraft marshalling and these can be used to great effect when demonstrating the required hand signals. However, tutors should choose the clips with care, some (especially the military versions) are a humorous look at the skill – not to be adopted in civilian aviation! As suggested for other units, a day return flight could be advantageous in giving learners an opportunity to observe marshalling from the gate, as they embark or on landing. However, observation cannot be guaranteed.

A good starting point would be the regulations and conventions – why do we need marshallers and what rules do they follow? A group discussion investigating the final elements of the arrival phase of an aircraft as it taxis from the runway should bring to light potential hazards such as poor manoeuvrability, reduced vision from the cockpit and difficulties assessing wing tip clearance. This should flow into how the marshalling system can reduce these hazards.

The process should be approached logically. Start with the preparation; the stand must be checked to ensure it is safe to accept the aircraft. Suggested obstacles are found in the unit content, but it is likely learners will think of additional debris.

Once satisfied that the stand is safe, the marshaller must guide the aircraft to its required stopping position. A look through CAP637 (Visual Signals Handbook, pages 10 to 19) shows all the signals. Copies of these pages could be provided for all learners. As there are a large number of signals, it would be beneficial to highlight the more frequently used, such as this stand, straight ahead, turn left/right, stop, chocks in place, together with the signals for cut engines and engine fire. At this stage, learners should be made aware that, at some airports, marshallers are also used during the pushback/power-back manoeuvre off stand. The departure signals are also found in CAP637.

The above assumes daylight marshalling in good visibility. It is important to point out that both night and adverse weather can change procedures. Illuminated wands are used to increase the visibility of the guidance gestures, and in extreme conditions a follow-me vehicle may be used in place of a static marshaller.

Linking the potential hazards of the marshaller's role with the PPE provided should contextualise the risks and how they are contained. The unit content contains an indicative list of both.

Certain actions must be taken to make an aircraft safe for others to approach following arrival on stand. Local rules and conventions will dictate who is responsible for what action, but frequently the marshaller will be involved in at least some of them. Equally, the reverse is the case when an aircraft is ready to depart the stand. A list is found for both in the unit content, any signals being found in CAP637.

The part that most learners will have been looking forward to is a practical session involving use of hand signals for arriving and departing aircraft. Obviously it is impractical to marshal real aircraft in this context, so fellow learners may have to act as aircraft, while the learner being assessed is the marshaller. This may be difficult to control within the classroom, so a large area such as a playing field or car park could be used. This should be marked up to represent standard ramp markings. It may be useful for learners to prepare A4 cards indicating each of the required signals, which can be shown in turn. These can help to raise awareness of the types of signal marshallers use, and can also be used during the practical assessment.

To extend their knowledge and ability learners should be given the opportunity to demonstrate the above role play using specific marshalling aids. This could include bats, illuminated wands, hi-vis jackets and hi-vis gloves.

The role play could be videoed giving learners the opportunity to view their performance, and make recommendations as to how it could have been improved.

Learners should be given the opportunity to analyse what could happen when safety checks and regulations are not carried out on the ramp. There are many checks that need to be complied with, however learners need to understand the implications of what goes wrong if any of these are missed. Group discussions or debates would be a good way to achieve a higher level of understanding.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan demonstrates one way of planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Introduction to aircraft marshalling including an explanation of the unit content. Learners to be introduced to the indicative reading material, including books, internet, journals etc. YouTube clips (make sure that the clips used are displaying a serious view of the skill).
Introduction to Assignment 1. Discussion – why do we need marshallers? What rules do they follow? Mind mapping exercise investigating the potential hazards/dangers associated with aircraft marshalling (e.g. poor manoeuvrability, reduced vision from the cockpit and difficulties assessing wing tip clearance). Small-group discussions – how can the marshalling system reduce hazards? Pair activity to research foreign object debris from engineering activities, caterers and loading activities.
Case study to explore the type of checks that should be carried out before the aircraft is brought onto stand. Paper-based exercise – examining CAP637 (Visual Signals Handbook) and highlighting the more frequently used signals for arrival and departure. Slideshow to show the different types of marshalling aid and the various types of PPE used in the marshalling process, including for night and adverse weather (e.g. illuminated wands and follow-me vehicles). Individual research activity into how weather conditions can affect the marshalling procedure. Guest speaker. YouTube clips.
Preparation for assignment Assignment 1: Prepare for a Safe Landing (P1, P2, P3, P4, P5, P6, P7, M1) Feedback on assignment

Topic and suggested assignments/activities and/assessment

Introduction to Assignment 2.

DVD/YouTube clips to show the correct hand signals that must be used during aircraft marshalling.

Classroom/playing field/car park activity using correct hand signals to bring an aircraft on and off stand (all signals in the assessment guidance should be demonstrated).

Classroom/playing field/car park activity using marshalling aids such as bats, illuminated wands, hi-vis jackets and hi-vis gloves to bring an aircraft on and off stand.

Tutor/peer observation – what improvements could be made in terms of learner performance?

Paper-based activity to explore the rules and regulations that govern aircraft marshalling.

Group discussion – actions required to make an aircraft safe prior to personnel approaching.

Tutor presentation on the actions required prior to aircraft departure.

Preparation for assignment

Assignment 2: Aircraft Marshalling (P8, P9, P10, P11, M2)

Feedback on assignment

Introduction to Assignment 3.

Discussion/debate – what could happen when safety checks and regulations are not carried out on the ramp? (For example, an aircraft not being clear of equipment).

Discussion/debate – what could happen if marshalling signals were not clear and effective?

Preparation for assignment

Assignment 3: Consequences of Non-compliance (D1)

Feedback on assignment

Assessment

A variety of assessment methods could be used including written work, presentations and role play. It is recommended that more than one assessment method is used to cater for different learning styles within a group.

The assessment criteria shown in the assessment and grading grid can be grouped together to enable learners to expand on one criterion in order to gain higher grades. Where possible learners should be encouraged, and given the opportunity, to meet the relevant higher grades at the same time as they attempt the appropriate pass criteria.

P1 – P2 – P3 – P4 – P5 – P6 – P7 – M1

P1, P2, P3, P4, P5, P6 and P7 could all be grouped together to create a written guide for new staff, including pictures, diagrams and text, detailing the role of the marshaller. Each criteria has its individual requirements but some could be assessed together. For example, P2 naturally links in with P7.

To achieve P1, learners must explain the purpose of aircraft marshalling in terms of safety and guidance.

To achieve P2, learners must describe the hazards specific to marshalling as listed in the unit content. It is appropriate to include assessment of P7 with P2.

To achieve P3, learners must identify at least six different types of FOD including their source, covering all the areas listed in the unit content. This can be a list with supporting illustrations.

To achieve P4, learners must describe the checks that must be undertaken before an aircraft can be guided to the stand. Learners must cover all areas listed in the unit content and provide examples where appropriate.

To achieve P5, learners must provide a list of three manual, two mechanical and one other marshalling aid. Learners can support their list with illustrations.

To achieve P6, learners must explain how weather can seriously impact on marshalling activities. Learners must include at least two personal precautions that must be taken, and two changes to marshalling procedures.

To achieve P7, learners must describe at least four different types of personal protective equipment (PPE) used in the marshalling process. Learners can support their descriptions with actual PPE or illustrations.

To achieve M1, learners should illustrate the procedures used to bring an aircraft onto and off stand safely in different weather conditions, covering all aspects of the pass criteria. Learners should make the procedures clear by annotating their pictures and diagrams. At least two different weather conditions must be covered.

P8 – P9 – P10 – P11 – M2

To achieve P8, learners must role play the marshalling of an aircraft as detailed below.

Marshall an 'aircraft' from the taxiway onto stand, ensuring it stops at the desired point, facing in the desired direction. Correct signals must be used throughout the manoeuvres, which must include:

- | | | | |
|---|-------------------------------------|---|-----------------------|
| a | this stand | d | stop |
| b | straight ahead | e | chocks inserted |
| c | turn left or right (as appropriate) | f | connect ground power. |

This should be followed by a demonstration of departure signals which must include:

- | | | | |
|---|-------------------------|---|------------------------------|
| a | engine start | c | chocks away |
| b | disconnect ground power | d | cleared to depart the stand. |

P9, P10, P11 could be grouped together to produce a presentation for new employees to accompany the leaflet for P1 to P7 and M2.

To achieve P9, learners must describe the rules and regulations that govern aircraft marshalling, together with the signals most frequently used by aircraft marshallers (all those listed in the unit content must be included).

To achieve P10, learners must describe the actions required to make an aircraft safe to approach after arrival on stand, covering all items listed in the unit content.

To achieve P11, learners must describe the actions required prior to aircraft departure, covering all items listed in the unit content. Learners could produce detailed flow charts to set out this information.

To achieve M2, learners must use marshalling aids to demonstrate bringing an aircraft onto and off stand safely for two separate scenarios, ensuring that rules, regulations and the correct actions are followed, and then evaluating own performance. For example, learners could role play bringing an aircraft onto stand during icy weather or the hours of darkness, verbalising the rules, regulations and the correct actions they are following. Learners could include recommendations for improvements when evaluating their own performance.

D1

To achieve D1, learners must analyse the effects of non-compliance with safety checks before bringing the aircraft onto stand. For example, learners could analyse the effects of not making sure the aircraft is clear of equipment (chocks, tug, bag cart) before bringing the aircraft onto stand, or what could go wrong if marshalling signals were not clear and effective when bringing an aircraft onto stand. Evidence for D1 should contain examples of situations and could be written or a verbal presentation supported by visual materials.

Recording performance

Evidence submitted to meet criteria requiring the practical demonstration of skills must be supported with observation reports signed and dated by the assessor explaining how and where specific criteria have been met. Range coverage should also be tracked clearly on the observation report or on checklists attached to the report. Learners should also sign the reports as being a correct record of their performance and achievement. Some supporting evidence, for example photographs, external supervisor or peer evaluations, audio or DVD recordings, should also be provided where appropriate. If performance is being observed by third parties, a witness statement must be completed, providing feedback on performance mapped to assessment criteria and range coverage. It is useful for a sample of learners to be internally verified at the same time as they are being assessed by the tutor.

Programme of suggested assignments

The table below shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the assessment and grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, P3, P4, P5, P6, P7, M1	Assignment 1: Prepare for a Safe Landing	You work for an aircraft marshalling company and have been asked to design an information leaflet for new staff.	Leaflet
P8, P9, P10, P11, M2	Assignment 2: Aircraft Marshalling	You work for an aircraft marshalling company and have been asked to put together a role-play activity and presentation for new staff.	Role play Presentation
D1	Assignment 3: Consequences of Non-compliance	You work for an aircraft marshalling company and have been asked to write a report (with illustrations) that analyses the consequences of non-compliance with regulations and safety checks when bringing an aircraft onto and off stand.	Report

Links to other BTEC units

This unit forms part of the BTEC aviation sector suite. This unit has particular links with the following unit titles in the aviation suite.

Level 2	Level 3	Level 4
Unit 23: Aviation Communications	Unit 2: Health and Safety in the Aviation Industry Unit 20: Ramp Handling Unit 21: Aircraft Dispatch Unit 28: Bird and Wildlife Control on Airports and Airfields	n/a

Essential resources

Learners must have access to examples of FOD, marshalling bats/wands, sample PPE and sufficient space to carry out practical demonstration. Learners also require access to the internet.

Employer engagement and vocational contexts

Due to high security levels and restrictions at airports it is rare to gain access to the ramp to witness aircraft marshalling. YouTube clips and videos are widely available but it would be beneficial to also arrange for marshallers as guest speakers. Smaller local airports may be easier to contact and speakers could be incorporated with a small airport visit.

Indicative reading for learners

Textbooks

Ashford N, Stanton H and Moore C – *Airport Operations* (2nd edition) (McGraw-Hill, 1997)
ISBN 978-0070030770

Collins V R – *Working in aviation* (Vacation–Work, 2004) ISBN 978-1854583222

Graham A – *Managing Airports – An international perspective* (3rd edition) (Butterworth-Heinemann, 2008)
ISBN 978-0750686136

Reiland K – *Airline career manual* (Createspace, 2010) ISBN 978-1453761267

DVD

Aircraft Marshalling (ICAO signals)

Journals

Airports International – Key Publishing Ltd

Airports of the World – Key Publishing Ltd

Airliner World – Key Publishing Ltd

Other publication

CAP637 Visual Signals Handbook (Civil Aviation Authority, 2007) ISBN 978-0117908444

Websites

www.caa.co.uk/docs/33/CAP637.PDF

www.fmt.se/index.php?id=85

www.hse.gov.uk/pubns/apis1.htm#2

CAP637 (Visual Signals Handbook)

APIS explained by manufacturer FMT

Health and Safety Executive guide to airport PPE

Delivery of personal, learning and thinking skills

The table below identifies the opportunities for personal, learning and thinking skills (PLTS) that have been included within the pass assessment criteria of this unit.

Skill	When learners are ...
Independent enquirers	explaining how weather conditions can affect the marshalling procedure
Reflective learners	describing the dangers of carrying out marshalling duties
Team workers	using correct hand signals to marshal aircraft onto and off stand
Effective participators	using correct hand signals to marshal aircraft onto and off stand.

Although PLTS are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are ...
Self-managers	exploring the rules and regulations that govern aircraft marshalling
Effective participators	participating in group activities and practical assessment.

● Functional Skills — Level 2

Skill	When learners are ...	
ICT — Use ICT systems		
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	designing an information leaflet for new staff	
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used		
Manage information storage to enable efficient retrieval		
Follow and understand the need for safety and security practices	as required	
Troubleshoot	ongoing.	
ICT — Find and select information		
Select and use a variety of sources of information independently for a complex task	designing an information leaflet for new staff.	
Access, search for, select and use ICT-based information and evaluate its fitness for purpose		
ICT — Develop, present and communicate information		
Enter, develop and format information independently to suit its meaning and purpose including: <ul style="list-style-type: none"> • text and tables • images • numbers • records 	designing an information leaflet for new staff	
Bring together information to suit content and purpose		
Present information in ways that are fit for purpose and audience		
Evaluate the selection and use of ICT tools and facilities used to present information		
Select and use ICT to communicate and exchange information safely, responsibly and effectively including storage of messages and contact lists		
English		
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts		demonstrating aircraft marshalling
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	writing up assignments.	