

Unit 65: Technical Stage Operations

Unit code:	D/502/5684
QCF Level 3:	BTEC National
Credit value:	10
Guided learning hours:	60

● Aim and purpose

The aim of this unit is to develop knowledge and practical experience of stage lighting, sound and video equipment for use in a performance situation. The unit will provide a grounding in all areas, allowing for development of particular specialisms.

● Unit introduction

This is a useful unit for all learners wanting to work in the theatre, whether they are backstage or onstage. In small-scale theatre groups all members carry out all roles.

In this unit, learners will get an introduction to the operation of sound, lighting and video equipment within a performance situation. The unit serves two purposes: for performers, it is a basic introduction to lighting, sound and video presentation that will be useful in small-scale touring; for technical learners, it provides an introduction to the more detailed specialist units in lighting, sound and video presentation and production.

Learners will be introduced to lighting, sound and video terminology, types of equipment, accessories and how the lighting, sound and video systems work. They will gain knowledge of the production process, including job and role allocation, the pre-production process and the production week. This covers rigs and fit ups, focus, plot and technical and dress rehearsals.

Learners will also get the chance to operate a performance as a technician; this includes the pre-show checks required.

The unit gives the basic skills required to work safely within a theatre environment and will give opportunities to use a range of equipment safely.

● Learning outcomes

On completion of this unit a learner should:

- 1 Know the technical skills used in the production process
- 2 Be able to apply the appropriate technical skills during the production process
- 3 Be able to perform as a technical operative.

Unit content

1 Know the technical skills used in the production process

Lighting: identification of different luminaries; rigging and focusing; patching; use of accessories; barn doors; iris; colour changers; gel; operation of industry-standard lighting controls; shutters

Sound: identification of different types of microphone; setting up and sound testing; use of accessories; mic stands; speaker stands; direct injection (DI) boxes; operation of mixing desk and playback equipment

Video: identification of different types of equipment; photometric data; lens angles; video sources; analogue and digital; interconnections; mixing; PC presentations; projection; fades; audio; animation; infrared

2 Be able to apply the appropriate technical skills during the production process

Pre-production: interpretation of plans; diagrams and/or instructions; sound/lighting requirements of the show; identification and preparation of appropriate equipment; identification of own role within a technical operations team

Production: get-in; fit-up; tech run; cut to cue; rehearsals; dress rehearsal; recording and responding to instructions; strike/get-out

3 Be able to perform as a technical operative

Pre-show: sound/lighting check; rehearse operation of equipment; clarify instructions/amendments; make any necessary adjustments; refocus/re-gel; repositioning of mics; adjustment of sound levels

Show: respond to cues/instructions; operate equipment

Post-show: shut down equipment; store items of equipment where necessary eg radio mics; back up discs; respond to feedback from stage manager; strike

Safe procedures: for handling and lifting heavy items; communicating and coordinating with others; working at heights; recognising potential hazards; electrical insulation; securing cables; keeping fire exits and gangways clear

Tools and equipment: access equipment; hand and power tools; electrical equipment; use of safety bonds; lens guards; heat-resistant gloves; keeping food and drinks away from operating equipment

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 outline the uses and operation of different types of lighting equipment [TW, IE]	M1 describe the uses and operation of different types of lighting equipment	D1 explain the use and operation of different types of lighting equipment
P2 outline the uses and operation of different types of video equipment [TW, IE]	M2 describe the uses and operation of different types of video equipment	D2 explain the use and operation of different types of video equipment
P3 outline the uses and operation of different types of sound equipment [TW, IE]	M3 describe the uses and operation of different types of sound equipment	D3 explain the use and operation of different types of sound equipment
P4 fulfil a role as a member of a technical team during the production process, with guidance and supervision [TW]	M4 fulfil a role as a member of a technical team during the production process, with minimal guidance and supervision [TW]	D4 fulfil a role as a member of a technical team during the production process efficiently and independently
P5 fulfil a role as a technical operator with support and guidance. [TW]	M5 fulfil a role as a technical operator with minimal support and guidance.	D5 fulfil a role as a technical operator efficiently and independently.

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 CT – creative thinkers	RL – reflective learners TW – team workers	SM – self-managers EP – effective participators
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Essential guidance for tutors

Delivery

This unit is almost entirely practical in nature; learners will need to work in groups and on their own on practical tasks. Some aspects of the unit may be taught via lecture-demonstration but learners will require hands-on experience.

Opportunities will need to be identified where learners can take on the role of operator. Each learner is required to operate sound, video and lighting during the course. There may also be opportunities for learners to gain the experience for this unit and assessment opportunities through work experience.

Safe working practices are a significant feature of the delivery of this unit.

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 in planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment

Introduction to lighting, sound and video: tutor

- lighting chain and types of lanterns and control
- sound chain and types of sound sources
- video chain and types of presentation editing
- working at height exercises
- electrical safety.

Assignment 1: Carry out Lighting for a Simple Production – P1, M1, D1, P4, M4, D4, P5, M5, D5

For a 10-minute sketch learners will act as the technical support:

- develop ideas for the requirements for the production
- set up lighting equipment
- focus and plot three scenes
- operate the lighting in performance.

Evidence will be provided through:

- observation
- show/production notes
- detailed diary.

Topic and suggested assignments/activities and/assessment

Assignment 2: Carry out Video Operation for a Simple Production – P2, M2, D2, P4, M4, D4, P5, M5, D5

For a 10-minute sketch learners will act as the technical support

- develop ideas for the requirements for the production
- set up video equipment
- record the performance or develop presentation
- edit performance video or presentation.

Evidence will be provided through:

- observation
- show/production notes
- detailed diary.

Assignment 3: Carry out Sound Operation for a Simple Production – P3, M3, D3, P4, M4, D4, P5, M5, D5

For a 5 minute sketch learners will act as the technical support:

- develop ideas for the requirements for the production
- set up sound equipment
- take part in the recording of three original sound effects
- operate the sound in performance.

Evidence will be provided through:

- observation
- show/production notes
- detailed diary.

Assessment

Evidence for this unit should be generated through learners producing practical work carrying out pre-production and operation tasks for lighting, sound and video projection. Much of the evidence for assessment of this unit is going to be generated through practical tasks and will rely on assessed observation. Initially, learners will need to be taught how to use the sound, video and lighting systems.

For lighting, learners should be able to identify at least three different types of luminaire, rig and focus at least 12 lanterns, operate a board that controls at least 12 channels and follow the plans, diagrams and instructions that relate to them.

For sound, learners should be able to identify at least two different types of microphones, set up a sound system that uses a power amp, a suitable mixer with a minimum of six inputs that include at least one type of playback equipment and two live sources (DI and/or mic) and a pair of loudspeakers as a minimum. They will also need to record at least two items from one sound source to another, for example two CD tracks onto a Minidisc™. Learners should be able to follow the plans, diagrams and instructions that relate to them.

Assessors will need to satisfy themselves that learners can set up, operate and strike one lighting set up and one sound set up successfully and safely. Learners also need to set up and operate sound and lighting equipment within the context of a performance. This need only be a small-scale performance such as a lunchtime concert. Within a larger-scale performance, the operation role could be divided between several learners.

For both sound and lighting operation, learners should be able to demonstrate their skill over a minimum of six cues in each role. Evidence for this unit will need documenting by tutors and may include self-evaluation and peer-evaluation reports.

Evidence can also be generated via a video and/or audio recording of a performance.

The video element of the unit is concerned with video applications that support a performance. As a minimum requirement, learners must demonstrate that they can set up a system with a single camera linked to a monitor. (A conventional CRT, LED/plasma screen or video projection screen are all acceptable display devices.) The use of video mixers and processing equipment is advantageous, but is not a requirement.

The basic requirements for this unit are that learners should rig and operate one sound system, one video system and one lighting system for a performance.

Each element can be documented in a number of ways to produce sufficient and reliable evidence for assessment purposes. Evidence of background research material should include manufacturer and product range research undertaken along with a presented report either written, spoken or using ICT. The differences and uses of each type of lanterns should be identified, and explained, with some technical notation. This should include, as a minimum, beam angles and wattage of the lantern, and a clear understanding of the differences between types of lantern and where each type would be used

Learners should maintain a working log/diary for the practical elements of this unit and should also have supporting evidence in the form of photographic, video and witness testimony. A permanent record of learners' achievements can best be made with photographic or video evidence of the effects or processes achieved in practical work. Written evidence would also be valid but it would be difficult to adequately detail the actual processes they used and, whilst acceptable as evidence, the production of this written evidence would be very time consuming.

Observational evidence from suitably qualified individuals in a professional environment would also be acceptable, subject to internal and external verification processes. Witness testimony or assessment should be undertaken and a record placed as evidence in learners' portfolios.

Some centres may use this unit as a method of providing lighting for their productions and must ensure that sufficient assessment opportunities for learners will be available. Although a modern memory control desk is advantageous, it is possible to complete this unit successfully using a two preset manual control desk, using a paper-based cue recording system.

Please note that it is not acceptable for learners to direct a member of staff or another learner in the rigging and focusing processes. Individual learners being assessed must carry out the mechanical process on their own. The term 'direction' used in this unit is the industry standard method of instructing another individual to carry out a remote task either directly or via a communications system.

Learning outcome 1 requires learners to demonstrate technical skills used in the production process.

Differentiation between pass, merit and distinction will be apparent through the depth of research, and the factors taken into account when devising their series of events.

Learners will need to articulate their understanding in writing, presenting their ideas to the management board.

At pass level, learners will list a range of types of lighting, AV and sound equipment. They should show a basic understanding of the types of equipment and manufacturers' product ranges. Evidence should show knowledge of the ranges of each equipment and where it could be used.

At merit level, learners will be describing the equipment; for M2, evidence should focus on where each lantern should be used and why. The information should be analysed and conclusions made as to where each type would be used and which type learners would choose and why.

At distinction level, learners will describe in detail a range of equipment, analysing advanced technical details and presenting reasoned arguments why equipment should be used in specific locations and for specific purposes. The work should be characterised by an independence and enthusiasm in approach and execution.

Learning outcome 2 requires learners to become part of the production team for a production. This will include undertaking production and crewing tasks.

At pass level, learners will be able to rig equipment and accessories safely with a large degree of support and guidance (this can be done as a simple rigging exercise on the floor, at this level). Other tasks will include teamwork, assisting other members of the team and carrying out own role with guidance.

At merit level, learners will be able to rig equipment with minimal guidance. An understanding of the safety requirements should be demonstrated, along with checking the area is safe before entering. Learners should be able to carry out tasks with minimal supervision.

At distinction level, learners should be able fulfil the role within a production team without help or guidance, demonstrating good safety awareness and teamwork.

Learning outcome 3 requires learners to perform as a technical operative; this should include the production of required notes and paperwork for the role, including cue sheets, notes, script with annotations.

At pass level, learners will operate equipment in a performance situation with support and guidance; basic supporting paperwork will be provided.

At merit level, learners will be able to operate equipment with minimal support. The notes produced will be detailed enough to allow the operator to use them efficiently in the production.

At distinction level, learners will be able to undertake the role of a technical operator independently. Detailed notes will be provided at a level that would allow someone else to take over with no knowledge of the production.

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, M1, D1 P4, M4, D4 P5, M5, D5	Carry out Lighting for a Simple Production	Learners act as technical support for an existing production, producing lighting requirements, setting up equipment and operating for performance.	Portfolio of evidence consisting of: <ul style="list-style-type: none"> • initial ideas • lighting notes • cue sheet/notes • diary • pre-production tasks • observation of pre-production • observation of performance/operation • video/photographic evidence.
P2, M2, D2 P4, M4, D4 P5, M5, D5	Carry out Video Production for a Simple Production	Learners act as technical support for an existing production, producing videos requirements, setting up equipment and operating for performance.	Portfolio of evidence consisting of: <ul style="list-style-type: none"> • initial ideas • video edit • cue sheet/notes • diary • pre-production tasks • observation of pre-production • observation of performance/operation • video/photographic evidence.
P3, M3, D3 P4, M4, D4 P5, M5, D5	Carry out Sound Operation for a Simple Production	Learners act as technical support for an existing production, producing sound requirements, setting up sound equipment, recording effects and operating for performance.	Portfolio of evidence consisting of: <ul style="list-style-type: none"> • initial ideas • sound notes • sound effects created • cue sheet/notes • diary • pre-production tasks • observation of pre-production • observation of performance/operation • video/photographic evidence..

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC Performing and Production Arts sector suite. This unit has particular links with the following unit titles in the BTEC Performing and Production Arts suite:

Level 1	Level 2	Level 3
Exploring Technical Skills for the Performing Arts	Lighting Operations for Stage Performance	Stage Technology Installation
	Sound Operations for Stage Performance	Temporary Stage Electrical Installations
		Stage Technical Maintenance
		Stage Lighting Operations
		Automated Stage Lighting
		Stage Sound Operations
		Live Sound for the Stage

This unit also has links with the following National Occupational Standards:

Technical Theatre

- CPD1 – Improving your skills
- CPD2a – TP Keeping up to date with technical and production developments in the live arts
- CPD4a – Contributing to technical production work for performance
- HSI – Working safely
- TP3.3b – Planning lighting requirements for a production
- TP20.2 – Operating lighting for a live performance in the theatre
- TP3.6a – Contribute to the planning of sound requirements for a production
- TP20.4a – Operating sound for a live performance in the theatre.

Essential resources

This unit requires learners to have access to a range of basic hand tools and soldering equipment. Care should be taken to ensure that there is adequate ventilation of working areas. Working materials such as audio, lighting, video connectors and appropriate cable should be available and, wherever possible, crimping and IDC facilities should be provided. Basic testing equipment will be required.

Learners will need access to 12 lanterns and lighting control system, desk (minimum 12 channels) and dimmers plus four microphones, sound source equipment, mixer (minimum six channels), amplifier and speakers and a camcorder and editing equipment as a minimum.

Employer engagement and vocational contexts

Because of current health and safety regulations it is very difficult to get any technical work experience in theatres. Therefore it is likely that the productions concerned will take place within the centre.

Indicative reading for learners

Textbooks

Fitt B – *A-Z of Lighting Terms* (Focal Press, 1999) ISBN 9780240515304

Fitt B and Thornley J – *Lighting Technology: A Guide for the Entertainment Industry Paperback* (Focal Press, 2001) ISBN 9780240516516

Huntington J – *Control Systems for Live Entertainment, 3rd Edition* (Focal Press, 2007) ISBN 9780240809373

Kaye D and LeBrecht J – *Sound and Music for the Theatre: The Art and Technique of Design* (Focal Press, 1999) ISBN 9780240810119

Palmer S – *Essential Guide to Stage Management, Lighting and Sound* (Hodder Education, 2000) ISBN 9780340721131

Reid F – *The Stage Lighting Handbook* (A&C Black, 2001) ISBN 9780878301478

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	understanding the use and operation of different types of lighting equipment understanding the use and operation of different types of video equipment understanding the use and operation of different types of sound equipment
Creative thinkers	problem solving
Team workers	setting up sound, lighting or video equipment
Effective participators	operating a performance.

● 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	using video editing systems
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	typing up notes and cue sheets
Manage information storage to enable efficient retrieval	saving work
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	video editing
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	video editing
ICT – Develop, present and communicate information	
Bring together information to suit content and purpose	video editing.