

Unit 71: Live Sound for the Stage

Unit code:	R/600/0176
QCF Level 3:	BTEC National
Credit value:	10
Guided learning hours:	60

● Aim and purpose

This unit enables learners to develop the skills and practices required to provide live sound for performance on stage.

● Unit introduction

This unit offers an alternative approach for learners interested in a career in the sound industry by focusing on the essential skills of providing sound for live performances on stage. The particular needs of live sound require alternative approaches to sound that differ from those for traditional theatre. Many components of this unit are related to planning venue use, the get-in and rigging of the equipment and the actual operation of the system during the performance. Virtually all venues accessible to the general public also have numerous health and safety issues that must be resolved before the performance. Learners will become familiar with these issues and the many ways of reducing risks.

Learners should also note that many of the skills developed in this unit are transferable to work in associated areas. Although the main aim is concentrated on live performances in conventional venues, there is scope within the unit to experience outdoor working and unconventional stage performance in alternative venues.

It may be possible for some of the assessed work to be carried out at local venues or other suitable locations. Wherever possible, learners will be working on real events that require professional quality sound services. Learners will work with microphones, speakers, mixers, etc in a variety of live contexts and be responsible for planning the live sound for events.

● Learning outcomes

On completion of this unit a learner should:

- 1 Be able to recognise the particular technical requirements for a venue and performance
- 2 Be able to set up sound equipment for a live performance
- 3 Be able to operate sound equipment for a live performance
- 4 Know about health and safety legislation as it applies to live performance.

Unit content

1 Be able to recognise the particular technical requirements for a venue and performance

Venue issues: acoustics (volume, absorption, reverberation time, early reflections, resonances, effects of the audience); technical riders; power supplies; stage size; FOH position and size

2 Be able to set up sound equipment for a live performance

Equipment: eg loudspeakers, amplifiers, multicores/multiway systems, mixers, monitors microphones, Direct Injection Boxes (DIs), stands, accessories, radio systems

Tasks: planning get-in, rig, get-out, soundcheck, mixing, effects, location issues

Roles and responsibilities: technicians, crew, technical direction, sound/lighting coordination, monitor mixing, front-of-house mixing, sound design, sound reinforcement/performance assistance

3 Be able to operate sound equipment for a live performance

Performers: positioning and allocation of microphones; headsets; transmitters; receivers; sound checks for instruments and vocalists; foldback and/or monitoring; control of feedback; acoustic sound; amplified sound; electronic and electro-acoustic instruments

Control: eg desk operation, effects, balance, blend, levels, running to cues, operating playback equipment, use of backing/click-tracks, operation of radio mics, talkback to crew

4 Know about health and safety legislation as it applies to live performance

Types of hazard: noise; lifting (LOLER: Lifting Operations and Lifting Equipment regulations); electricity; hazardous substances (COSHH: Control of Substances Hazardous to Health regulations); liquids; crowd safety

Control: risk assessment; implementation; records

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 criteria for a pass grade describe the level of achievement required to pass this unit.

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 describe the venue issues for a selected performance [IE, RL]	M1 explain the venue issues for a selected performance	D1 critically comment on the venue issues for a selected performance
P2 produce a functional technical rider	M2 produce a competent rider that will allow the critical issues to be resolved in an effective manner	D2 produce a comprehensive rider that will allow all the issues to be resolved in a professional manner
P3 rig, connect and test a sound system with support and guidance [TW, SM]	M3 rig, connect and test a sound system with minimal support and guidance	D3 rig, connect and test a sound system independently
P4 describe the roles and responsibilities of the complete sound crew for a selected performance [IE, RL]	M4 explain the differences between the roles and responsibilities of the complete sound crew for a selected performance	D4 critically comment on the effectiveness of the different sound crew roles for a selected performance
P5 operate equipment for live performance in a non-demanding situation [TW, SM, EP]	M5 operate equipment in an appropriate manner, responding to performer requirements if necessary	D5 operate equipment with accuracy, flair and an artistic feel for different material, reacting professionally to unexpected events should they arise
P6 identify hazards likely in a typical performance venue. [IE, RL, SM]	M6 assess the hazards likely in a performance venue.	D6 assess and formulate plans to reduce hazards likely in a performance venue.

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

The centre will need to stage a series of live events that can be used as the basis of activity for this unit. Learners will work in small teams to provide the audio facilities for individual events. It is suggested that centres manage the distribution of roles to enable all learners to experience the different roles and responsibilities of FOH operation. The underpinning knowledge can be delivered in conventional larger group sessions. It is vital that centres devise adequate methods of tracking learners' progress when working in small teams, as each learner may have a different objective and area of responsibility.

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 unit and structure of the programme – whole group.
Venues, facilities and technical riders.
Assignment 1: Can the Venue Meet Your Rider? – P1, M1, D1, P2, M2, D2 (consider access, space, services, physical elements) <ul style="list-style-type: none">• Research three venues with 25 miles of your location.• Consider requirements.• Produce your rider.• Consider how changes can be made/solutions found to enable the performance.
Introduction to sound systems.
Introduction to health and safety .
Workshop sessions – setting up equipment and sound checks.
Assessment opportunity for P3, M3, D3
Assignment 2: Setting up Sound Systems – P3, M3, D3, P6, M6, D6
Introduction to roles and responsibilities.
Assignment 3: Roles and Responsibilities for Forthcoming Music Nights – P4, M4, D4
Event season starts – Thursday Night Music Sessions – P1, M1, D1, P2, M2, D2, P3, M3, D3, P4, M4, D4, P5, M5, D5, P6, M6, D6 Each team has a minimum of three slots. Each slot requires minimum of eight hours practical work to meet the production plan.
Hazard assessment after first Music Night.
Assignment 4: Review of Safety Issues After First Event – P6, M6, D6
Introduction to radio microphone systems.
Advanced sound systems – types and operation.

Topic and suggested assignments/activities and/assessment

End of year concerts – external venues – P1, M1, D1, P2, M2, D2, P3, M3, D3, P4, M4, D4, P5, M5, D5, P6, M6, D6

Each team has a minimum of two slots.

Each slot requires minimum of 12 hours practical work to meet the production plan.

Final catch-up sessions – revisit any outstanding work or criteria.

Review unit and assignments.

Feedback from assignment.

Assessment

This unit is also suitable for work-based delivery if the assessment requirements can be satisfied. Learners who are able to gain work experience will be able to use this work as evidence for the unit if the centre can arrange verifiable evidence collection that allows correct grading to be applied. Witness statements, observational evidence, video recordings and similar types of evidence can all be used to support the awarding of grades. Centres need to ensure that grades are awarded for work that learners have carried out themselves, not simply been present at. For example, a learner cannot be credited with having mixed a performance when in reality they have only been responsible for playing in backing tracks, or un-muting a desk channel, while someone else is actually mixing.

The requirement for learners to rig, connect and operate a PA system requires them to start with an empty space – all equipment must be then placed in position, connected, powered up and tested. Merely powering up an already set up system is not acceptable practice. It is recognised that in most cases a system may well be permanently installed, but at some stage all learners must experience the entire process.

The nature of this unit is that individual learners will work on events of all sizes that are typical of those found within the industry from small, simple and fairly undemanding ones through to complex events that require considerable resources and planning. Centres need to ensure that sufficient projects will be available to allow all learners to access all of the grade areas of the criteria descriptors. This typically requires the centre to rotate learners carefully through a number of different events to allow everyone to practise their skills and develop techniques that will allow access to the higher grade levels. It may be possible to use simulations or rehearsals for the practice elements, making the actual event an assessed activity. Video or audio recordings are a good method of providing long term evidence for assessment. Assessment criteria may be interpreted as relating to many different roles within a production. The obvious role of sound engineer, out front with the audience is the usual role, but the criteria also allow for a learners to undertake many other roles during the get in and setting up phases. Group activity may take place in the set up phases, but assessors need to make sure evidence to support an individual grade for each learner is collected.

Learning outcome 1 is concerned with being able to recognise the requirements of the performance within the context of what a venue can provide. Much of the work revolves around being able to generate appropriate technical riders that can be given to venues, along with understanding of the circumstances that may prevent these riders being acted upon. Learners will need to appreciate the physical characteristics of a performance venue that may restrict the venue's ability to meet the requirements. Being able to consider these and modify the rider is an important element.

Learning outcome 2 deals with the set up of the actual equipment. Learners have to install the equipment, carry out any testing or soundchecks, and in most cases remove it after use. There is a direct link to the health and safety outcome, as some of the equipment is heavy and awkward to move, and there is an electrical safety element to be considered.

Learning outcome 3 is concerned with the operation of the equipment for a live performance. Centres may use the term 'operate' in any appropriate manner that relates to learners carrying out the end process of controlling the sound element of a production. It is not linked to complexity of task, or the duration of the show. Assessors need to ensure that each learner is given the opportunity to access all available grade levels during the delivery period of the unit, with some scope to repeat activities to allow for grade improvement.

Learning outcome 4 is important as it requires learners to be aware of health and safety Legislation and be able to apply it to their work. Many of the tasks they carry out could have possible health and safety implications and it is important that the management of safety is given a high priority during the delivery period of this unit.

To achieve P1 and P2, learners must be able to describe the venue issues that could have an impact on the event, and produce a technical rider that could be sent to the venue in advance of the event. This technical rider must be useable. The requirements for M1 and M2 are that the rider must be competent; no required information missing. For the purposes of this unit, this would include useful extra information, such as a requirement for parking for a van, or confirmation that the correct type of electricity supply is available. For access to the D1 and D2 grades the venue issues must have critical comment and the rider produced must contain comprehensive details, leaving no important area to chance.

Criterion 3 requires learners to rig, connect and test a sound system. The key differences between the grade levels are the support and guidance elements. Learners carrying out instructions accurately under guidance with extensive support when problems occur are able to achieve the P3 grade. If the support and guidance provided is minimal, then this allows achievement at M3. Learners operating independently can be awarded D3.

Criterion 4 needs learners to have knowledge of the roles and responsibilities of the individuals within a sound crew working on a selected event. Venues should ensure that learners are aware of the differences in structure between small events and large ones. Being able to describe these roles and responsibilities is the requirement for the P4 grade. If learners can explain the differences between roles then M4 grade is appropriate. Critical comment on the effectiveness of some of the different roles is the requirement for D4 grade to be awarded.

Criterion 5 is linked to the operation of equipment. The equipment is not specified, so could be the main FOH mixer, the radio microphone receivers, an on-stage mixer or indeed any other specialist technical equipment used within the live sound area. The key area is to provide accurate and properly balanced sound appropriate to the event in question. A simple event, with few microphones and other sound sources running at low volume levels may not offer learners very demanding situations to cope with, and if this is the case, then the grade awarded would be P5. Learners may be required to cope with a number of sources, required effects, frequency of cues, mixer re-sets, etc; this increases workload and the pressure, and if they demonstrate the capacity to respond in an appropriate manner, then M5 grade can be awarded. If learners show the ability to respond to events in an artistic manner, showing a flair for subtle touches and working very accurately – this is professional behaviour and can be awarded at D5 level.

Criterion 6 requires learners to demonstrate understanding within the health and safety field. To achieve a P6 grade they must be able to correctly identify hazards commonly found in a performance venue. Being able to assess these hazards is the requirement for access to the M6 grade. Once learners are able to appropriately assess a risk they may be able to formulate a strategy to reduce the risk to an acceptable level. If their risk reduction plan is sound, then they may be awarded the D6 grade.

Programme of suggested assignments

The table below shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the 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, P2, M2, D2	Can the Venue Meet Your Rider?	As a sound technician, learners will be preparing riders and considering the venue's ability to meet them.	<ul style="list-style-type: none"> • Learner written work and/or presentation.
P3, M3, D3	Assessment opportunity	During workshop sessions collect evidence showing learners setting up systems.	<ul style="list-style-type: none"> • Assessor observation. • Video/audio recordings.
P3, M3, D3	Setting up a Sound System	Time-limited assessment activity.	<ul style="list-style-type: none"> • Assessor observation. • Video/audio recordings.
P3, M3, D3	Roles and Responsibilities	Learners will be considering their roles for the forthcoming sessions.	<ul style="list-style-type: none"> • Learner written work. • Formal presentation.
P1, M1, D1 P2, M2, D2 P3, M3, D3 P4, M4, D4 P5, M5, D5 P6, M6, D6	Event season starts	Learners start to work on real events as sound technicians.	<ul style="list-style-type: none"> • Learner documentation. • Assessor observation. • Witness statements. • Video/audio recordings.
P6, M6, D6	Safety Issue Review	Learners review safety issues after first event.	<ul style="list-style-type: none"> • Learner written work. • Formal presentation.

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 Stage Performance	Sound Operations for Stage Performance	Stage Sound Operations
	Crewing for Stage Performance	Live Sound for the Stage
		Production Arts Workshop
		Technical Stage Operations
		Stage Sound Design

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
- TP3.6a – 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 a basic level of equipment to be available to learners. As a guide the following list should be used as a guide to the minimum level of equipment needed to allow learners to achieve a full range of grades:

- a high-quality touring style PA system with either active loudspeakers or conventional passive cabinets with separate amplifiers. Note: mixers with built in amplification are not suitable
- monitor loudspeakers – active or passive with separate amplifiers
- sub-bass loudspeakers – active or passive with separate amplifiers
- analogue or digital microphone multi-way system
- a mixing desk with sub-groups, muting and a minimum of 24 input channels, six auxiliaries
- a selection of outboard equipment featuring compressors, effects, limiters and equalisation (internal software versions such as found on digital mixers are acceptable for this unit)
- power distribution systems that satisfy current regulations and are safe for inside and outside events
- a selection of microphones, DI boxes, cables and stands
- effective transportation/storage/flight cases for the equipment.

Employer engagement and vocational contexts

Centres should develop links with local theatres and other entertainment venues. Centres with learners aged under 16 need to be aware that placements or real work experience are rarely available in theatres because of legal restrictions.

Indicative reading for learners

Textbooks

Davis G and Jones R – *The Sound Reinforcement Handbook* (Hal Leonard Publishing, 2008) ISBN 9780881889000

Fraser N – *Lighting and Sound Theatre Manual* (Phaedon Press, 1988) ISBN 9780714825144

Kemp C and Hill I – *Health and Safety Aspects in the Live Music Industry* (Entertainment Technology Press, 2004) ISBN 9781904031222

Stark H – *Live Sound Reinforcement* (Course Technology, 2005) ISBN 9781592006915

White P – *Basic Live Sound* (Sanctuary Publishing, 2000) ISBN 9781860742712

White P – *Basic Mixers* (Sanctuary Publishing, 2000) ISBN 9781860742668

White P – *Basic Mixing Techniques* (Sanctuary Publishing, 2000) ISBN 9781860742835

White P – *Recording and Production Techniques* (Sanctuary Publishing, 2002) ISBN 9781860744433

White P, Mead D and Gladwell R – *Studio Recording Basics A (Basic Mixing Techniques, Effects & Processors, Multitracking & Mixers)* (Sanctuary Publishing, 2002) ISBN 9781860744730

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 ...
Team workers	rigging and using sound systems
Self-managers	identifying hazards and formulating plans
Effective participators	carrying out the practical elements of the unit.

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 ...
Independent enquirers	identifying venue issues and producing riders considering roles and responsibilities
Reflective learners	considering the technical rider content researching the differences between roles.

● Functional Skills – Level 2

Skill	When learners are ...
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	researching roles and responsibilities, health and safety legislation and venue information
Mathematics	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	preparing riders that require weight and/or size information. Weight could also be a critical factor in some health and safety considerations
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	responding to the requests of the venue, health and safety representatives and team members
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	using published equipment specification to prepare riders and production documentation using research sources to analyse venue information and complex legislation style data.