

Unit 70: Stage Sound Design

Unit code:	K/502/5641
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 design sound to support a production.

● Unit introduction

Sound design for the stage is becoming more important as the general public become more accustomed to hearing high quality, realistic sound in all venues. This unit allows learners the opportunity to experiment with sound design and produce working systems that satisfy the requirements of stage production of all genres and sizes. This unit blends technical knowledge and operational skills with artistic elements and introduces some functional business and planning components that are becoming more necessary in an industry with heavy demands placed on it in terms of time and budget management.

The modern practice of separating the duties of the audio department into front-of house and on-stage operation has been followed in general concept, but allowing some crossover which is more suitable for learners at this level.

Learners should also note that many of the skills developed in this unit are transferable to work in associated areas. Nightclubs, churches, exhibition centres, public buildings, radio and television all require staff with a thorough working knowledge of sound design and budget preparation. It may be possible for some of the work to be carried out at local venues or other suitable locations.

Amateur and professional work experience will enhance the opportunities for learners to demonstrate their sound skills and integrates easily into the unit structure.

There is some commonality between this unit and *Stage Sound Operations*, but the focus is very different. This unit is designed to develop learner skills in the design areas of sound. The basic building blocks of sound theory and an understanding of equipment types are not assessed in this unit. This unit uses these fundamental concepts and relates them to performance, where being able to fulfil a design remit is the critical factor. There is a focus on the production process and sound for many different performance genres. Centres may offer either or both of the units to suit their requirements. There is no requirement to study *Stage Sound Operations*, although this is an ideal progression route through this study area.

● Learning outcomes

On completion of this unit a learner should:

- 1 Know the components of existing stage sound designs
- 2 Be able to undertake the role of sound designer within the production process
- 3 Be able to apply advanced studio techniques to a range of production genres
- 4 Be able to operate sound equipment for performance.

Unit content

1 Know the components of existing stage sound designs

Traditional design approaches for: eg musicals, ballet, drama, opera, dance, classical music, rock/pop music, performance art, outdoor events

2 Be able to undertake the role of sound designer within the production process

Pre-production: development of ideas; movement and musical analysis; scene/script specific design; themes; spatial awareness

Performance: understanding conventions; space

Relationships: director; designer; crew; performer; management

Budgets and planning: equipment sourcing; budget and quotation preparation; documentation; plans; time management and planning

3 Be able to apply advanced studio techniques to a range of production genres

Sampling/editing: sample rates; resolution; data compression; looping; editing; time-stretching; pitch shift and correction

Multi-tracking: digital and analogue recording; soundscapes; layering; mix-down to stereo and multi-channel

Signal processing: compression; limiting; effects; time domain; basic MIDI implementation

4 Be able to operate sound equipment for performance

Front-of-house mixing and operation: mixing; balancing; system eq; groups; effects and track playback; fx play-in systems; cue sheets; scripts and documentation; outboard or internal processing and effects

On-stage operations: power supply implementation and safety; analogue/multiway/digital cabling systems; radio microphone system set-up and management during performance; personal microphone management for performers; monitor mixing; on stage microphone and other equipment management

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 outline generic sound design attributes and compare alternative approaches to sound design [IE, SM, RL]	M1 explain generic sound designs and compare a range of alternative approaches to sound design from different genres	D1 analyse generic sound designs and compare a range of alternative approaches to sound design from different genres
P2 produce designs that mainly follow conventions and show ability to react to production requirements [CT, SM]	M2 produce designs that follow conventions and show considered ability to react to production requirements	D2 produce designs that follow conventions with innovation and show ability to predict production requirements and satisfy them in a professional manner
P3 use studio techniques to produce usable products suitable for public performance [CT, SM, TW]	M3 use studio techniques to produce usable products suitable for public performance, with minimal support and guidance	D3 use studio techniques autonomously to produce usable products suitable for public performance
P4 operate as stage and FOH operator following codes and conventions of the genre. [CT, EP, SM]	M4 operate as stage and FOH operator following codes and conventions of the genre with minimal support and guidance.	D4 operate as stage and FOH operator following codes and conventions of the genre in a fully independent and professional manner.

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

Typically, this unit will be delivered by a series of workshop sessions that enable learners to try out techniques while working towards a real event of some kind. The scale of these events can be a simple performance perhaps requiring just a single microphone and instrument that requires the operator to plan for, and then balance the sound for an audience. It can also be extended to include a major, complex production being planned over many weeks. The outline learning plan detailed in this unit is an example of how time could be managed in a centre with a busy programme of events, spread across production and performance pathways. Many centres will wish to scale these productions down to meet the demands of learner numbers and available teaching time outside of formal sessions.

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 gives an indication of the volume of learning it would take the average learner to achieve the learning outcomes. It is indicative and is one way of achieving the credit value.

Learning time should address all learning (including assessment) relevant to the learning outcomes, regardless of where, when and how the learning has taken place.

Topic and suggested assignments/activities and/assessment
Introduction to unit and structure of the programme – whole group.
Examples of historic sound designs – classical through to Jesus Christ Superstar.
Examples of contemporary sound designs – the birth of modern musical theatre.
Sound design – producers, planning and budgets.
The role of the sound designer – examples and techniques: <ul style="list-style-type: none">• plays• operetta• musicals – traditional• musicals – modern• pantomime.
Assignment 1: Two Contrasting Designs – P1, M1, D1
Production 1 – concept and planning assignment 2 – explanations and preparation.
Assignment 1: Grades and Presentations to Revisit – P1, M1, D1
Preparation for Assignment 2 – Designs for Production 1 – Boogie Nights (initially a simulation for all learners, later a specific role for a number of learners).
Introduction to the show, history, examples and likely problems.
Production 1 – pre-production issues.
Production 1 – production issues.
Production 1 – relationships and links, budgets and planning.

Topic and suggested assignments/activities and/assessment

Assignment 2: Boogie Nights Planning – P2, M2, D2

Production 1 – Boogie Nights band recording sessions for CD – intro session.

Recording sessions – each learner manages a track, with an assistant if required.

Post production on recorded material.

Assessment of recorded material opportunity to cover – P3, M3, D3 – assessor and/or peer group assessment.

Pre-production for Boogie Nights show – distribute roles and responsibilities.

Pre-production continues – P3, M3, D3, P4, M4, D4

Production week – work continues and show days – P3, M3, D3, P4, M4, D4

Review of show – opportunity to revisit – P1, M1, D1 as comparison task

Preparation for Assignment 3 – Designs for Production 2 – We Will Rock You (initially a simulation for all learners, later to be a specific role for a number of learners).

Introduction to the show, history, examples and likely problems.

Production 1 – pre-production issues.

Production 1 – production issues.

Production 1 – relationships and links.

Production 1 – budgets and planning.

Assignment 3: We Will Rock You Planning – P2, M2, D2

Production 1 – We Will Rock You band recording sessions for CD – intro session.

Recording sessions – each learner manages a track, with an assistant if required.

Post production on recorded material.

Assessment of recorded material opportunity to cover – P3, M3, D3 – assessor and/or peer group assessment.

Pre-production for We Will Rock You show – distribute roles and responsibilities.

Pre-production continues – P3, M3, D3, P4, M4, D4

Production week – work continues and show days.

Assignment 4: Individual Projects – Stage an Event – P2, M2, D2, P3, M3, D3, P4, M4, D4

- Form production team with music, performing arts or dance learners.
- Carry out the role of sound designer.
- Liaise with all members of the production team.
- Confirm budget and equipment requirements.
- Produce material.
- Operate event.

Final catch-up sessions – revisit any outstanding or need for improvement criteria.

Assessment

Many centres will alternate skills building sessions with the real event sessions. Assessors need to monitor roles the learners are carrying out during this period. The terms FOH operator and on-stage operator have been used to differentiate between roles – the first is the front-of-house main operator, responsible for balancing the sound heard by the audience. In practice, this person is in charge. The on-stage operator may be situated on stage, or sometimes front-of-house assisting the FOH operator. In many situations, the on-stage operator will carry out the duties of fitting and managing radio microphone systems, rigging stage equipment, possibly playing in audio tracks and other similar tasks. In most cases, some work carried out by the on-stage operator will be on the specific instructions of the FOH operator. This system should enable all learners to rotate in their technical roles and experience a wide range of alternative techniques and working areas.

As an example, it is possible to have a number of on-stage operators working in different roles on a single event. Centres are free to select the evidence that is most appropriate to the unit. Both video and audio recordings are acceptable, along with real or simulated production documentation devised by learners. Witness statements and observation records are also suitable but care must be taken for the assessor to actually witness the work carried out by learners.

The nature of this unit is that individual learners will carry out the many individual components that comprise the working area of a sound designer. 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 an assistant on stage, perhaps looking after radio microphone systems, or another learner tasked with running the on-stage sound with monitors and instrument amplifiers under their control. All these roles can meet the 'Operate as stage and FOH operator' requirement. 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 the components of a sound design, and learners will compare different approaches to producing a sound design for a production. There are many different genres that can be considered and learners can also consider productions spanning a large timescale. In most cases, learners will be able to use two or more contrasting productions as the stimulus for their analysis of individual sound designs.

Learning outcome 2 deals with the production of designs. These designs do not have to be converted into an actual event, although in many cases, there will be an end product. Learners can use this outcome to hone their planning and development skills. Centres can use a mixture of simulation and real events to manage this area of the specification.

Learning outcome 3 relates to studio techniques. This area of study is built around products created by learners that support and enhance their productions. Typical products could be audio recordings that can be used for many purposes – click-tracks, backing tracks, mood enhancement, or sound effects, or the products could be learner-produced material constructed within a computer based environment. The scope for this area of the specification is very large – the key being that the product must be of sufficient quality to be used in public.

Learning outcome 4 is concerned with the final process, operate the sound for 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.

To achieve P1, learners need to be able to describe the features of generic sound designs, and be able to compare alternative approaches to a similar end product. In most cases, they will be looking at specific productions, perhaps from different periods in theatre history. They can then compare the differences and similarities, considering the reasons why the designs are different. For the Pass criterion, learners can describe the different designs they have researched, but will not be able to explain the critical elements. Once they have explained these components, this will allow the M1 grade to be awarded. The requirement for the D1 grade is their ability to analyse the alternate approaches. Assessors should also note that access to the M1 and D1 grade also requires the comparisons to be made between productions from different genres. This ensures that learners will not simply pick a single genre, such as Musical Theatre, as the focus of their comparison if they desire the merit or distinction grade.

Criterion 2 requires learners to produce designs. The usual conventions of a sound design, such as features, operational style, budget and functionality need to be present for P2, although at this grade level learners may depart from convention slightly, as long as the end design would still function. Their design must be flexible enough to allow it to be modified in light of changes to the production requirements. The M2 grade is applied to work that does not depart from convention and has built in scope for modification as required. Learners who can predict changes to production requirements, rather than react to them, and can show some innovation in their designs have access to the D2 grade.

Criterion 3 requires learners to be able to use studio techniques to be able to produce products for public performance. P3 can be awarded if the product is suitable for use. Assistance in the form of detailed guidance and step-by-step instruction from staff or other learners is acceptable at this level. If the level of assistance is minimal then the M3 grade can be awarded. The D3 grade is reserved for learners who can act with independence, working to their own plan.

Criterion 4 requires learners to operate following established codes and conventions. As with criterion 3, learners who require detailed guidance can be awarded the P4 grade. If assessors establish that the assistance has been minimal, then learners may be awarded the M4 grade. Again, the D4 grade is reserved for independent work.

Important note: The criteria descriptor for criterion 4 requires learners to operate as stage and FOH operator. In this unit, learners will cycle through roles, so centres need to ensure that criterion 4 is covered twice, once for FOH work and again when learners are working on stage, in another role. Some events could require the operator to do both roles – perhaps by being the only operator and having to mix both front of house and operate on-stage monitors. This does not constitute carrying out both roles in the context of this unit. The segregation of the roles described here is more applicable to theatre sound rather than traditional live sound. The on-stage role encompasses monitor duty and control of body-worn and hand-held microphones.

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	Assignment 1 Two Contrasting Designs	Learners will be analysing sound designs through the ages.	<ul style="list-style-type: none"> • Learner written work and/or presentation.
P2, M2, D2	Assignment 2 Part 1 Planning for Boogie Nights	Learners will be investigating the previous professional productions and considering the changes required for their own production.	<ul style="list-style-type: none"> • Learner written work. • Assessor observation. • Video/audio recordings. • Photographs. • Collected data.
P3, M3, D3	Assignment 2 Part 2	Boogie Nights recording sessions.	<ul style="list-style-type: none"> • Learner written work. • Video/audio recordings.
P3, M3, D3, P4, M4, D4	Boogie Nights pre-production and production phase	Learners enter the practical production phase of the production.	<ul style="list-style-type: none"> • Learner written work. • Assessor observation. • Video/audio recordings. • Photographs. • Collected data.
P1, M1, D1	Review of show	Learners can compare their production with another – an opportunity to revisit this criterion.	<ul style="list-style-type: none"> • Learner written work.
P2, M2, D2	Assignment 3 Part 1 Planning for We Will Rock You	Learners will be investigating the previous professional productions and considering the changes required for their own production.	<ul style="list-style-type: none"> • Learner written work. • Assessor observation. • Video/audio recordings. • Photographs. • Collected data.
P3, M3, D3	Assignment 3 Part 2	We Will Rock You band recording sessions for CD.	<ul style="list-style-type: none"> • Learner written work. • Video/audio recordings.
P3, M3, D3, P4, M4, D4	Assignment 4 We Will Rock You pre-production and production phase	Learners enter the practical production phase of the production.	<ul style="list-style-type: none"> • Learner written work. • Assessor observation. • Video/audio recordings. • Photographs. • Collected data.

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

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
- TP2.4a – Contribute to developing and refining ideas for sound
- TP2.4b – Developing and refining ideas for sound
- TP3.6a – Contribute to the planning of sound requirements for a production
- TP3.6b – Planning sound requirements for a production
- TP20.4a – Operating sound for a live performance in the theatre.

Essential resources

The resources required for this unit are similar to those required for *Stage Sound Operations*.

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. Centres should have available equipment that allows learners to provide the types of services found in modern entertainment technology applications. This consists of recording and PA equipment. The expectation is that learners will be able to use more complex equipment at Level 3 than at Level 2.

For recording, learners require access to hardware or software recording systems capable of handling multi-channel sound. In the context of this unit, this should be a minimum of 8 discrete tracks, although most software-based systems are capable of more than this. Equipment must be able to handle both microphone and line level sources and be capable of supplying phantom power. DI boxes, dynamic and condenser microphones should be available, along with typical accessories such as stands, cables and basic test equipment. Computer-based editing facilities are required and access to external media sources for sound effects and other useful source material should be available.

Learners need to have access to radio microphone systems during the delivery period of this unit. These may be hired in for specific productions if not permanently available.

Learners need to use suitable PA systems for the duration of this unit. Such a system will obviously need to be suited to the venues available to the centre, but as a guide are likely to be passive or active systems with extended bass response, capable of delivering sufficient volume to suit the genre of performance. Wherever possible, such a system will mimic the operational style of bigger systems found in common use within the industry. A simple portable plug-and-play budget system is unlikely to be suitable for use within this unit. There is no requirement for digital state of the art equipment as long as the equipment available is in good condition and can provide the facilities required to allow access to all grade areas. Proper monitoring systems are essential for learners to demonstrate their skills in mixing both front of house sound, but also mixing monitors for performers. Although a modern digital mixer may appear to be advantageous, it is possible to complete this unit successfully using a basic small format analogue mixer of professional quality as long as it has a sufficient number of inputs and outputs. Facilities such as graphic eq, compressors and limiters and signal processing need to be available for use by the learners.

Employer engagement and vocational contexts

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

Indicative reading for learners

Textbooks

Davis G and Jones R – *The Sound Reinforcement Handbook* (Hal Leonard Publishing, 1990)
ISBN 9780881889000

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

Stark H – *Live Sound Reinforcement* (Course Technology, 2004) 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, Mead D and Gladwell R – *Studio Recording Basics A (Basic Mixing Techniques, Effects & Processors, Multitracking & Mixers)* (Sanctuary Publishing, 2002) ISBN 9781860744730

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

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 ...
Creative thinkers	producing sound designs and products for use within performance
Team workers	working together to produce material in the recording studio
Self-managers	operating on stage, or FOH – also when they are producing their initial designs to real timescales.

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	carrying out research and comparing existing sound designs from different genres
Reflective learners	considering the elements contained within specific existing sound designs.

● 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 computer based recording equipment to generate material to be used in a production, or using it to edit and manipulate sound in the pre-production process
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	involved in researching sound designs used in productions from different genres
Mathematics	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	preparing budget proposals and using estimation and measurement to determine physical properties of the components of the designs they produce
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 producer, director or other production 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 hire lists, budgets and production documentation. using research sources to analyse the component elements of existing sound designs.