

Unit 48: Music Recording

Unit code:	A/600/6649
QCF Level 3:	BTEC National
Credit value:	10
Guided learning hours:	60

● Aim and purpose

This unit aims to develop learners' understanding of – and ability to use – the range of techniques required to record effectively, using appropriate methods for the source material.

● Unit introduction

Well-recorded music is essential to most audio-visual media productions from games, documentaries and costume dramas to sports and news broadcasts and animations. The choice of music to fit the production is as important as the sound quality. Sound and music not only set the mood and emphasise the emotional content of the production but also focus the viewer's or listener's attention on other content.

As the quality of domestic audio equipment increases, consumers will demand better and better quality sound, so it is essential that learners appreciate and learn the basic principles that lead to high quality sound recording.

Those who work in this sector of the industry are aware that clarity and sound integrity are of utmost importance and that this can be achieved only through a knowledge of the principles of sound recording and production techniques. This enables the achievement of the appropriate sound treatment for different transmission media. Developing an understanding of the basic language of sound, along with associated listening skills, will also help learners to critically evaluate their own and other learners' work and compare it to past and current practitioners.

This unit will allow learners to gain experience of current music recording technology in the context of the traditional skills that the technology developed from. It will develop their basic audio recording skills (such as mic'ing up instruments and recording from different sources) within the context of the music industry and will allow them to gain experience and understanding of the recording studio environment. The unit also aims to elaborate on skills learned elsewhere in the audio pathway, such as audio capturing, mixing and editing, and to relate them specifically to the music recording industry.

● Learning outcomes

On completion of this unit a learner should:

- 1 Understand production characteristics of music recordings
- 2 Be able to mic up musical instruments in different recording situations
- 3 Be able to record music from different sources for specific contexts
- 4 Be able to mix and remix music recordings from different sources.

Unit content

1 Understand production characteristics of music recordings

Genre: eg dance music, rock, indie, reggae, jazz, classical, country, world music

Sound: quality; factors influencing quality (acoustic reflection, absorption, resonance, background noise); crowd noise; expression; emotion; involving listener

Recording: stereo; mono; multi-track; analogue and digital recording systems; reel-to-reel tape; noise reduction; software recording and editing systems; current hardware and computer interfaces; effects and processors; mastering considerations

2 Be able to mic up musical instruments in different recording situations

Locations: eg recording studio, concert hall, open air, church, stadium, indoor arena, warehouse, classroom

Microphone: types, eg dynamic, condenser; pick-up patterns (polar diagrams, directional, omni-directional, cardioid, hypercardioid)

Musical instruments: strings, eg piano, guitar, violin, cello; wind, eg flute, oboe, clarinet, trumpet, French horn, trombone; percussion, eg drums, cymbals, hi-hat, maracas, tambourine; other, eg electronic, ethnic

3 Be able to record music from different sources for specific contexts

Pre-recording: run through; rehearsal; level and sound checks; performance; gain structures; routing; studio session; stereo; mono; multi-track recording; connections; proximity effect; live recording; acoustic adjustment; screens

Electronic instruments: direct injection; synthesisers; electric guitar; drum machine; electric piano; keyboard; midi; computer-based software

Recording: monitoring systems; monitoring levels; headphones; fold-back systems; talkback; identifying tracks; track sheets; overdubbing; listening for distortion; checking playback

4 Be able to mix and remix music recordings from different sources

Mixing: mixing original material; remixing existing or found material; pan; equalisation; reverberation; compression; expansion; limiting; effects units; grouping

Mastering: producing the stereo or mono recording; mastering system and format; format needs of client; final sound sweetening

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 review the production characteristics of music recordings with some appropriate use of subject terminology [IE]	M1 explain the production characteristics of music recordings with reference to detailed illustrative examples and with generally correct use of subject terminology	D1 comprehensively explain the production characteristics of music recordings with elucidated examples and consistently using subject terminology correctly
P2 mic up musical instruments in different recording situations with some assistance [CT]	M2 mic up musical instruments in different recording situations to a good technical standard with only occasional assistance	D2 mic up musical instruments in different recording situations to a quality that reflects near-professional standards working independently to professional expectations
P3 produce recorded music from a variety of sources for specific contexts with some assistance [CT]	M3 produce recorded music from a variety of sources for specific contexts to a good technical standard with only occasional assistance	D3 produce recorded music from a variety of sources for specific contexts to a quality that reflects near-professional standards working independently to professional expectations
P4 produce examples of mixing and remixing music using different sources with some assistance. [SM]	M4 produce examples of mixing and remixing music using different sources to a good technical standard and with only occasional assistance.	D4 produce examples of mixing and remixing music using different sources to a quality that reflects near-professional standards working independently to professional expectations.

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

It is vital in this unit that learners understand the importance of the basic principles of music recording and how to develop their listening skills. They should also become aware of the need to experiment with many different types of music and sound. Learners can be encouraged to experiment with sounds in nature and the environment. They can learn to listen to how those sounds change in different acoustic environments. They will need to record music from programmed and pre-recorded sources as well as acoustic instruments.

To do this it is essential that learners are taught the importance of gain structures and level controls in both the digital and analogue domains. Understanding signal flow through a mixing console and monitoring equipment is also essential as this will help learners to understand the many software mixing packages available.

Through learning outcome 1 they should learn the importance of planning a recording for different music genres and the needs that the situation will present. Much of this work can be by directed research using the wealth of material now available. Demonstrations and class lectures would be appropriate for the delivery of the theory, although learners should be encouraged to 'fact find' for themselves.

The remainder of the work for this unit should put that theory into practice. An active experimental approach is encouraged for the practical elements. It will be useful for lecturers to give audio examples of well-recorded and badly recorded sound and also demonstrate the effect of gain overload and the resulting distortion.

One straightforward exercise is to record the same sound with different microphones having varying pick-up patterns. Learners can then discuss the different characteristics of the microphones and their usage. They can also discuss the effect of the acoustic environment the music is being played in. It will be useful for learners not only to electronically record the music for presentation but also to write descriptions of the sounds in a sound log or journal for future reference. It is sometimes useful to measure and note the distance and position of microphones graphically.

When recording music, learners should also be aware of the needs of the musicians, ensuring that microphones do not inhibit performance and that there is good communication between musicians and technical personnel. Exercises can be designed for either group, pair or individual work, but learners will get the greatest benefit from working and discussing together. Learners should therefore be encouraged to work and experiment together, taking care to generate, for themselves, sufficient evidence of their discussions and the results. It is intended that the exercises follow tutor instruction on the concepts needed for the exercise and that exercises in recording techniques follow a logical progression from instrument to master recording. After this, learners should be comfortable with exploring the subjects on their own. Learners can be encouraged to make presentations of their recordings and discuss the problems encountered and how they approached solving them.

There are several trade journals that give useful information on recording and production techniques and in this way learners can obtain information about basic principles and keep up with techniques currently being used by professionals. Many of the microphone and other equipment manufacturers give excellent technical and application information on their websites. There are also a number of very good books that learners can refer to for techniques.

As this unit is designed to be relevant to the learner's career, it will be desirable that professionals from the industry visit and describe the number of roles and functions that they fulfil and how they communicate with others in the production process. It is also essential that learners are given a sense of good working practice.

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 teaching and assessment of this unit.

Topics and suggested assignments and activities
Introduction to unit and unit assessment.
Whole-class sessions covering production characteristics, including listening sessions and examples of analogue and digital recording equipment.
Assignment 1 – Production Characteristics <ul style="list-style-type: none">• assignment overview• individual and class discussions – example and methods• research and preparation of report/presentation with diagrams• assessment review with opportunities for grade improvement.
Whole-class sessions with examples of microphones with associated equipment, and discussion of techniques.
Assignment 2 – Microphones and Locations <ul style="list-style-type: none">• assignment overview• individual and group practical – portfolio evidence building• preparation of report/presentation, diagrams and diary• assessment review with opportunities for grade improvement.
Practical exercises on recording skills with microphones and direct injection (DI), including individual skills development.
Assignment 3 – Recording Techniques <ul style="list-style-type: none">• assignment overview• individual practical sessions – producing sound tracks• preparation of materials, diagrams and diary• assessment review with opportunities for grade improvement.
Whole class sessions on final production.
Assignment 4 – Ready to Release? <ul style="list-style-type: none">• assignment overview• practical mixing sessions• collating evidence and report writing• assessment review with opportunities for grade improvement.

Assessment

Evidence for assessment

Evidence generated for the assessment of this unit can take various forms. The first is written material (for example looking at the specifics of equipment types). Evidence for this type of work might be presented as a report with audio and graphic examples. The second form of evidence might be observations of learners carrying out procedures (for example, positioning microphones) supported by learners' accompanying documentation, such as sketches of microphone positions. Finally, for practical activities, evidence will comprise recorded audio material along with reports describing the processes undertaken.

Recordings produced should exemplify experimentation with different recording and mixing equipment and the effect on sound of changing the recording location. Reports can be in the form of logs, portfolios or blogs, which should contain evidence of how the recordings were planned and executed. Evidence could include track sheets, pre-production planning schedules, and studio and equipment booking procedures. Reports, presentations and references to articles in trade journals might also be suitable assessment vehicles, as would content for a CD ROM or website designed for training and learning purposes.

Evidence based on conversations between a tutor (or assessor) and the learner must be recorded in some way, ideally on MiniDisc™ or video. If the recording is in writing (as witness or observation reports) care must be taken to ensure that at least 50 per cent of such assessments are subject to internal verification. Presentations also must be recorded for the purposes of internal and external verification.

For some elements of this unit, and for some learners, a formal viva voce assessment might be appropriate. When more than one learner in a cohort is assessed in this way, care must be taken to ensure that all learners are asked equivalent questions, and that all are given equal opportunities to expand or clarify their answers. Interviewers must also ensure that questions are not phrased in such a way as to provide or suggest an answer. Formal vivas should be recorded for the purposes of internal and external verification and at least 50 per cent of such assessments must be internally verified.

Application of grading criteria

When applying the grading criteria, tutors should follow the advice given below. Please note that any examples of evidence given here are indicative only. This advice is not exhaustive and the examples need not specifically be included in a learner's work in order for that learner to achieve the exemplified grade.

Pass

To achieve a pass grade, learners must achieve all the criteria for that grade. For each of the criteria learners must present evidence that addresses each italicised sub-heading of the content for the learning outcome.

P1: learners will give accurate and substantially full, though not absolutely complete, descriptions of the factors that they need to take into account before a recording. When pre-planning a recording, a learner might note, 'There are several factors that need to be taken into account when planning the sound quality of a recording. The most important are acoustic reflection, absorption, resonance, and background noise.' Evidence will show a basic understanding of technical terminology but learners will generally be unsure about this vocabulary and will make fairly frequent mistakes when they do use it.

P2: learners will connect up and place microphones for different types of instruments in at least two different locations, though they will not work with complete confidence and will often need assistance, for example with the correct placement of a microphone near the sound-hole of an acoustic guitar to enable an effective recording.

P3: the quality of the sound should be acceptable in that all instruments are recognisable and not masked by each other and the acoustic environment. There should be no distortion or interference that spoils the listening experience.

P4: learners will create a suitably presented finished and mixed recording that will include sound from different sources. The sounds should be balanced competently and given an appropriate position and depth. If learners have used copyright material they must show an awareness of copyright issues. They will show that they have read some of the subject material now readily available and have planned their production in relation to any legal and copyright issues.

P2, P3 and P4: when engaged in practical activities, learners will need frequent assistance and support, though they will take note of and make use of this help when it is given. If they are in frequent need of such help but fail to make positive use of it, they should not be considered for a pass grade for this unit.

Merit

To achieve a merit grade, learners must achieve all the pass and all the merit grade criteria. For each of the criteria learners must present evidence that addresses each italicised sub-heading of the content for the learning outcome.

M1: learners will address issues in some depth and will refer to well-researched and appropriate examples, showing a good understanding of their topics and revealing consideration of how or why the issues mentioned in the content for this learning outcome have importance. When pre-planning a recording, a merit grade learner might comment, 'We wanted to record the drums and acoustic guitar at the same time but were aware that the sound of the drums would spill too much onto the acoustic guitar. Therefore we planned to overdub it later or try to record it in a separate room.' Learners will use technical vocabulary for the most part correctly, but may make mistakes or be unsure about usages at times.

M2: learners will produce recordings of several sound sources using different microphone techniques, positions and patterns. They will show from the recordings that they are able to experiment methodically to achieve the desired results. This follows normal professional practice. Learners will generally show confidence in the handling of equipment, but might need occasional help or advice. They will be aware of technical problems such as the signal to noise ratio, distortion and other unwanted noise.

M3: the recordings presented will be clear and well balanced. There will be evidence that the learner is aware of the 'spill' between different microphones and they will show how they have used the position of the instruments and microphone patterns to overcome this.

M4: learners will successfully manage the project from inception through to conclusion and show that they are aware of the constraints and potential of the equipment that they have used. They will have documented their progress regularly and will explain the choices they have made. They will also document the problems they have encountered and the process used to get around them. They will document the roles of the people involved in the recording process.

M2, M3 and M4: when engaged in practical activities, learners will need little assistance, though typically they will still need some support when dealing with more complex technology or trying to apply more sophisticated techniques. Like the pass grade learner, they will respond positively to any help given.

Distinction

To achieve a distinction grade, learners must achieve all the pass, all the merit and all the distinction grade criteria. For each of the criteria learners must present evidence that addresses each italicised sub-heading of the content for the learning outcome.

D1: learners will justify the points they make, providing reasons for their explanations, and making clear their depth of knowledge and understanding of how the well-researched examples they provide illustrate their arguments. Learners will therefore present work that is comprehensive in scope with lucid, well-described and appropriate examples illustrating points made. For example a learner might comment, 'Because of the high SPL (sound pressure level) created by the kick drum I decided to use a dynamic/moving coil microphone best suited to the task – an AKG D12.' They will show that they have read some of the available material in depth and have applied the research to their own projects. They will describe the roles of the personnel involved in their recording and how these might equate to professional practice. They will also show that they were aware of the group dynamics involved in the recording. They will thoroughly plan their project and anticipate problems by planning for the correct use of equipment with an awareness of the constraints. Technical vocabulary will be secure and used correctly and confidently at all times.

D2, D3 and D4: learners will produce near-professional recordings, and give fluent, confident descriptions of the alternatives they faced in the process. They will show ingenuity and imagination in their problem solving. When discussing their projects, distinction grade learners will show clearly how decisions have been taken with the whole project in mind as well as the individual parts. They will show a depth of knowledge about how acoustic environments and microphone types interact and might, for example, note, 'The reflections from the walls of the room that we recorded in created a ringing sound at the microphone and interfered with the sound source. We were aware that we could use a directional microphone pattern and moved the microphone closer to the source. However, this would not give the desired sound, so we found materials that would deaden the reflections and taped them to the walls. We changed the position of the sound source and used up-ended tables covered with blankets to make improvised screens. In the end we were forced to consider another environment to record the music in.' These learners will have worked independently to produce recordings to a quality near to that expected for professional distribution. The finished products will be technically correct, and the productions will show that learners have used the available media with flair and imagination. The productions will have the feel of a marketable product. In all practical activity, distinction level learners will be capable of working autonomously and effectively. This means that they are able to work on their own initiative, do not need constant support or supervision, give the work their full commitment, work positively and cooperatively with others, and meet deadlines. In other words, they have the kind of self-management skills that would be expected of them in a professional context. Note also that this criterion should not be taken to mean that learners do not seek advice or that they work without discussing things with their tutor, but rather that they are not dependent upon the support of others and that when they take advice they weigh it carefully for themselves.

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	Assignment 1 – Production Characteristics	Brief from a technical magazine to write a piece on how certain well-known albums were recorded.	<ul style="list-style-type: none"> Individual written piece. Diagrams. Technical information.
P2, M2, D2	Assignment 2 – Microphones and Locations	Brief from a location recording company, looking to hire a trainee engineer, to evidence knowledge of microphones for specific applications.	<ul style="list-style-type: none"> Report on microphone requirements for specific applications. Layout and connection diagrams. Portfolio of recordings.
P3, M3, D3	Assignment 3 – Recording Techniques	Brief from a location recording company to expand on original submission, to include material recorded in a range of real-life situations.	<ul style="list-style-type: none"> Tutor observations. Audio recordings. Recording log.
P4, M4, D4	Assignment 4 – Ready to Release?	Brief from a production company to complete mixes of both original and found material to a specific brief.	<ul style="list-style-type: none"> Tutor observation. Audio recordings. Written report.

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

This unit forms part of the BTEC Creative Media Production suite. This unit has particular links with the following units in the BTEC Creative Media Production suite:

Level 2	Level 3
Audio Production	Audio Production Processes and Techniques
	Introduction to Music Technology

There are opportunities to relate the work done for this unit to Skillset National Occupational Standards in Sound as follows:

Sound

- S1 Work effectively in sound production
- S2 Identify, devise and manage the sound requirements
- S11 Acquire sound using a microphone
- S13 Mix sound live
- S14 Mix recorded sound
- S16 Make sound recordings
- S19 Document and store media
- S20 Edit sound.

Essential resources

Resources needed for this unit include portable recording equipment, such as different types of microphones and microphone stands, and cabling of various lengths.

A professional-standard recording studio, properly structured for learning purposes, is desirable. Tape recording and analogue editing may still be relevant for a number of years, but should no longer be a primary activity, although the principles used are essential to the understanding of the language and operation of nonlinear software. It is important that there is a good listening environment with good and accurate sound monitoring equipment that will encourage critical listening.

A library should hold copies of up-to-date books on the music industry and recording, and relevant journals such as *Sound on Sound*, *Pro Sound News*, *Resolution*, *Audio Media* and *NME* should be readily available to learners.

Employer engagement and vocational contexts

Centres should develop links with local recording studios and production companies. Local producers, musicians and songwriters are usually willing to come in and talk about techniques and methods for production and composition.

Skillset, the Sector Skills Council for the creative media sector, has a substantial section of its website dedicated to careers, including job descriptions – www.skillset.org/careers/.

Further general information on work-related learning can be found at the following websites:

- www.aimhighersw.ac.uk/wbl.htm – work-based learning guidance
- www.businesslink.gov.uk – local, regional business links
- www.nebpn.org – National Education and Business Partnership Network
- www.vocationallearning.org.uk – Learning and Skills Network
- www.warwick.ac.uk/wie/cei – Centre for Education and Industry, University of Warwick – work experience and workplace learning frameworks.

Indicative reading for learners

Textbooks

Baylis P, Freedman A, Procter N et al – *BTEC Level 3 National Creative Media Production, Student Book* (Pearson, 2010) ISBN 978-1846906725

Baylis P, Freedman A, Procter N et al – *BTEC Level 3 National Creative Media Production, Teaching Resource Pack* (Pearson, 2010) ISBN 978-1846907371

Bartlett and Bartlett – *Practical Recording Techniques* (Elsevier, 2005) ISBN 978-1592784461

Borwick J (editor) – *Sound Recording Practice, 4th Edition* (Oxford University Press, 1996) ISBN 978-0198166085

Crich T – *Recording Tips for Engineers* (Elsevier, 2005) ISBN 978-1592784332

Huber and Runstein – *Modern Recording Techniques* (Focal Press, 2005) ISBN 978-0240806259

Moulton, D – *Total Recording* (KIQ Productions, 2000) ISBN 978-0967430402

Nisbett – *Sound Studio* (Focal Press, 2004) ISBN 978-0240519965

Paul J (editor) – *The Live Sound Manual* (Backbeat Books, 2002) ISBN 978-0879306378

Rumsey F and McCormick T – *Sound and Recording, 5th Edition* (Focal Press, 2006) ISBN 978-0240521633

White P and Prochak M – *Basic Mixing Techniques* (Sanctuary Music Technology, 2004) ISBN 978-1860742095

White P and Prochak M – *Basic Microphones* (Sanctuary Music Technology, 2004) ISBN 978-1860743634

Journals

Audio Media

Light and Sound International

NME

Pro Sound News

Resolution

Sound on Sound

Website

www.soundonsound.com – site which accompanies and supports the publication *Sound on Sound*; it contains useful equipment reviews and pieces on technique (subscription required for full access)

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	exploring issues when reviewing production characteristics or covering new studio techniques through experimentation
Creative thinkers	generating ideas and exploring possibilities when producing recorded sound and mixing and editing sound questioning assumptions when applying new techniques
Self-managers	organising time and resources when mixing and editing sound responding positively to change, when developing new techniques.

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 ...
Reflective learners	setting goals when reviewing work following feedback from assessor inviting feedback and responding to the opinions and criticism of others
Team workers	collaborating when working in teams for practical studio activities providing constructive support and feedback when participating in production meetings.

● Functional Skills – Level 2

Skill	When learners are ...
ICT – Use ICT systems	
Manage information storage to enable efficient retrieval	saving written and creative work
Follow and understand the need for safety and security practices	using computers to create music productions
Troubleshoot	operating workstations
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	researching for assignments
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 	preparing work for assessment
Bring together information to suit content and purpose	preparing work for assessment
Present information in ways that are fit for purpose and audience	preparing and delivering presentations.