

# Unit 25: Music Production Techniques

<b>Unit code:</b>	<b>M/600/6972</b>
<b>QCF Level 3:</b>	<b>BTEC National</b>
<b>Credit value:</b>	<b>10</b>
<b>Guided learning hours:</b>	<b>60</b>

## ● Aim and purpose

The aim of this unit is to develop learners' awareness of the equipment and techniques used in recording studios to the extent that they can produce a complete studio recording.

## ● Unit introduction

Despite developments in computer software, the elements required to produce a studio recording remain little changed. There is a huge range of equipment available, so choosing which equipment to use depends on being able to match the specification of the equipment to the sonic characteristics of the sound source to be captured.

Learners will be required to demonstrate every aspect of the recording process. Setting up the chosen equipment to suit the musical situation is only one part of this process. It is also vital that the learners understand the importance of setting up equipment appropriately, and with an awareness of the health and safety issues involved.

Capturing performances as multitrack recordings involves a mixture of skills, not just technical, but also musical and organisational.

Learners will also be required to mix their recordings to a format suitable for distribution to a non-technical audience, as a conclusion to the unit.

## ● Learning outcomes

### On completion of this unit a learner should:

- 1 Understand manufacturers' specifications for a range of audio recording equipment
- 2 Be able to set up the equipment required for a recording session
- 3 Be able to capture audio sources using multitrack recording techniques
- 4 Be able to mix multitrack recordings.

# Unit content

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## 1 Understand manufacturers' specifications for a range of audio recording equipment

*Microphones:* polar pattern; frequency response; sensitivity; type eg dynamic, condenser, ribbon, boundary

*Mixing desks:* routing; channels; busses; auxiliaries; groups; inputs; outputs; facilities eg EQ, monitoring

*Recording devices:* tracks; inputs; outputs; format eg standalone, computer-based digital audio workstation, audio interface; specification eg protocol, bit depth, sample rate, noise figures

*Monitoring:* eg nearfield, midfield, full range, frequency response, two-way, three-way, passive, active, power rating

## 2 Be able to set up the equipment required for a recording session

*Microphone techniques:* eg spot mic'ing, close mic'ing, ambient mic'ing, spaced pair, coincident pair, middle and sides, DI

*Routing:* eg patchbays, input gain settings, gain structure, busses and groups, recording device settings, recording level, talkback, foldback, dynamic control

## 3 Be able to capture audio sources using multitrack recording techniques

*Audio sources:* eg drum kit, guitar, bass, piano, woodwind and brass instruments, orchestral instruments, single and multiple voices

*Technical issues:* eg talkback, fold back, click track, managing takes, data storage/archiving, track laying, overdubbing

*Organisational issues:* eg tuning instruments, working with musicians, communication, organisation, timekeeping, keeping records, preparation, clearing up

## 4 Be able to mix multitrack recordings

*Volume:* eg balancing levels, fadeout, automation, headroom, output level

*Pan/balance:* eg using the stereo field, phase issues, idiomatic treatment

*Dynamic control:* eg noise gates, compressors, side chains, limiters, expanders; dynamic range

*Equalisation:* creative EQ; remedial EQ

*Effects:* connection eg inserts, sends; type eg time domain effects, dynamic processors; specific effects eg reverb, delay, chorus, flanger; distortion effects eg guitar amp simulation, overdrive, bitcrusher; ambient control

*Editing:* eg comping, top and tail edits, trimming, normalising, fades

*Bouncing down:* eg file types, real-time, off-line, start and end points

## 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:
<b>P1</b> explain manufacturers' specifications for a range of audio recording equipment [IE, SM]	<b>M1</b> illustrate manufacturers' specifications for a range of audio recording equipment	<b>D1</b> analyse manufacturers' specifications for a range of audio recording equipment
<b>P2</b> set up the equipment required for a recording session competently with limited tutor support [IE, CT, RL, SM, EP, TW]	<b>M2</b> set up the equipment required for a recording session confidently with total independence	<b>D2</b> set up the equipment required for a recording session demonstrating mastery of the processes involved
<b>P3</b> capture audio sources using multitrack recording techniques [IE, CT, RL, SM, EP, TW]	<b>M3</b> capture audio sources using multitrack recording techniques competently	<b>D3</b> capture audio sources using multitrack recording techniques with confidence and flair
<b>P4</b> mix multitrack recordings. [IE, CT, RL, SM]	<b>M4</b> mix multitrack recordings competently.	<b>D4</b> mix multitrack recordings with confidence and flair.

**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

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### Delivery

Most, if not all, of this unit should be delivered through practical workshops. Learners will need to access the technology required to conduct multitrack recording sessions, including microphones, sound generating equipment and musical instruments, and recording and mixing equipment, and appropriate spaces that allow effective decisions to be made on equipment choice and setup based on critical listening. Ideally learners should have access to a wide range of equipment and be encouraged to experiment with different recording equipment and techniques in order to discover which methods are most effective. Where possible, physical equipment (as opposed to virtual) should be used. Concepts such as signal path and routing, problem solving and health and safety issues are far more easily understood when signals are traced through real cables and equipment.

Learners should be engaged in the process of creating music product from an early stage of the unit delivery, with the required theoretical and contextual elements of the unit added as necessary. The theory behind recording would be best delivered in a practical way. Learners must be encouraged to adopt a professional time-conscious approach to the recording process from the beginning.

Resources will need to be carefully managed to allow learners enough session time to create the evidence required for each outcome. Time demands of individual projects will need to be carefully assessed before allowing production to proceed, as class time is likely to focus on team activity, with learners required to cycle through a variety of roles, including producer, engineer, assistant, performer, etc. as necessary. Learners will need access to resources outside of timetabled contact time in order to enable them to complete the practical work necessary for this unit. It is also potentially the case that this unit will be delivered alongside other units, whose outcomes require evidence to be captured in the recording studio, and time for this must be allowed in addition to that allowed for this unit.

Mixing can take place in a computer-based environment as a classroom-based activity but learners must be made aware of the limitations of mixing on headphones and be encouraged to check their mixes on various reference systems as often as possible. This may add to the time where learners require access to studio resources outside of contact time.

## 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 the programme and structure of the programme of learning.
Understanding manufacturers' specifications for recording equipment – learning outcome 1; theory classes on: <ul style="list-style-type: none"><li>• types of audio equipment</li><li>• how the performance of audio equipment is measured</li><li>• manufacturers' specifications.</li></ul>
<b>Assignment 1: The Specification of Recording Equipment – P1, M1, D1</b> <ul style="list-style-type: none"><li>• Learners to prepare presentations with tutor facilitation.</li><li>• Learners to give presentations.</li><li>• Peer and tutor feedback to be reviewed and actions noted.</li></ul>
Setting up recording equipment – learning outcome 2; tutor-led workshops to cover: <ul style="list-style-type: none"><li>• setting up microphones</li><li>• setting up input gain</li><li>• setting up the routing required for recording</li><li>• setting up foldback mixes.</li></ul>
Capturing a multitrack recording – learning outcome 3; tutor-led workshops to cover: <ul style="list-style-type: none"><li>• capturing audio to the recording device</li><li>• overdubbing</li><li>• punching in</li><li>• managing recording sessions.</li></ul>
<b>Assignment 2: Setting up and Capturing a Multitrack Recording – P2, M2, D2, P3, M3, D3</b> <ul style="list-style-type: none"><li>• Learner practical work/resource-based learning.</li><li>• Creating recording logs.</li></ul>
Mixing the multitrack recordings to stereo – learning outcome 4; tutor-led workshops to cover: <ul style="list-style-type: none"><li>• mixing techniques</li><li>• editing techniques</li><li>• bouncing down.</li></ul>
<b>Assignment 3: Stereo Mix – P4, M4, D4</b> <ul style="list-style-type: none"><li>• Learner practical work/resource-based learning.</li><li>• Creating mixing log.</li></ul>

## Assessment

This unit is not only about learners understanding of recording equipment and their ability to use it to create musically acceptable products, but also about their understanding and management of the entire studio production process.

Learning outcome 1 is most easily evidenced through a written report, but as an alternative this evidence could be collected by directed questioning in a practical context. If so, this must be carefully controlled in order to capture the full range of technical information required, and allowing for the group situation in which much of the practical work will be carried out.

To achieve a pass for learning outcome 1 learners will provide simple unelaborated explanations of the terminology. At merit level learners will elaborate their explanations with reference to appropriate examples. At distinction level, learners will discuss the importance of each aspect of terminology in relation to the recording process and the application of given examples in the recording process based on a specification. It is appropriate to compare different examples in terms of suitability at this level. The learning outcome asks for an understanding of a 'range' of recording equipment. Referring to the unit content, this should be a minimum of three of the subheadings (in italics) shown there. Learners should aim to cover all the indicated content for each subheading, as they will gain a clearer understanding where topics are not dealt with in isolation. For example, an understanding of routing in a mixing desk will be supported by knowledge of channels, busses, inputs, outputs and so on.

To create evidence for learning outcome 2, learners should be demonstrating both microphone techniques and routing as indicated in the unit content. It is likely that learners will spend significant amounts of time working independently due to resourcing issues and the style classroom management associated with this unit, and so for this learning outcome it is essential that observations are carried out rigorously to support evidence of higher grading. Further, learners should be encouraged to keep clear records of their activities, perhaps using pro forma documentation, as it will be difficult to return to the required activities if assessment opportunities are missed.

To achieve P2 learners will successfully setup and configure microphones and recording equipment for a multitrack recording session, but they may require some tutor intervention. Learners who require no tutor intervention will be working at Merit level, and this will be evidenced by tutor observation of learner demonstration. Distinction level learners will show through their written work that they have a clear understanding of all of the processes involved, in addition to the requirements for P2 and M2.

It is likely that capturing audio takes place as part of the same recording sessions. That is, the evidence for learning outcome 3 will be created during the same practical workshop sessions as for learning outcome 2. Learning outcome 3 requires the capture of audio to a multitrack recording device, and for P3 learners will submit the unmixed audio, perhaps as a sequencer project/session if a software digital audio workstation is being used. For M3, the tutor observation report will show the correct use of a range of appropriate skills. This could be augmented by the written evidence submitted by learners (for example, the recording log, tracksheets, etc). To achieve D3, the evidence will show that learners have mastered the skills required (technical and organisational) to the extent that their ability to track audio in recording sessions is not inhibited by technical limitation. Skills such as capturing takes and dropping in, and the use of the monitoring section will have been used in such a way that the results show creativity and imagination.

Learning outcome 4 will be evidenced by the submission of the multitrack recordings (to suitable stereo format) and accompanying written report. Learners whose submissions show the use of mixing skills will achieve P4. Where mixing skills have been applied correctly and in such a way as to enhance the original recordings, this will evidence M4. For D4, the evidence will show that learners have mastered the skills of mixing to the extent that creativity, flair and imagination are uninhibited by technical limitation.

## 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	The Specification of Recording Equipment	Describe a range (minimum three from unit content) of recording equipment.	<ul style="list-style-type: none"> <li>Written piece.</li> <li>OR: presentation.</li> <li>To include referencing.</li> </ul>
P2, M2, D2 P3, M3, D3	Setting up and Capturing a Multitrack Recording	Set up the required equipment and perform the various tasks required to capture a multitrack recording of a musical performance in the recording studio.	Evidence to include: <ul style="list-style-type: none"> <li>recording log</li> <li>tracksheets</li> <li>photographic evidence</li> <li>tutor observation reports</li> <li>unmixed audio recordings on CD.</li> </ul>
P4, M4, D4	Stereo Mix	Use mixing techniques to create a stereo mixdown of their multitrack project.	Evidence to include: <ul style="list-style-type: none"> <li>stereo mixdown</li> <li>mixing log.</li> </ul>

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

This unit forms part of the BTEC Music and Music Technology sector suite. This unit has particular links with the following unit titles in the BTEC Music and Music Technology suite:

Level 1	Level 2	Level 3
	Producing a Musical Recording	Delivering a Music Project
		Planning and Delivering a Music Project
		Music Project
		Major Music Project

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

Technical Theatre

- CPD1 – Improving your skills
- CPD2b – Ensure that you and your team keep up to date with the technical and production areas of the live arts
- HSI – Working safely
- TP2.4a – Contribute to developing and refining ideas for sound (C1)
- TP2.4b – Developing and refining ideas for sound (C1).

## Essential resources

Ideally learners should have access to soundproof recording facilities, in order to provide them with the best opportunity to achieve high quality close-mic recordings. Recording equipment should be as contemporary as possible, but should, as a minimum, provide the facility to monitor and mix recorded material, and apply effects and other audio processing.

Learners will need access to a wide range of industry standard microphones of differing types and specifications.

Learners will also need access to classroom resources for the preparation of written materials and research tasks.

Mixing can take place using classroom-based computer set-ups, providing the software digital audio workstations provided come with a complete range of mixing tools and facilities. Although it is unlikely that there will be sufficient access to resources for learners to mix individual projects in the recording studio, it is important that learners spend some time, perhaps in tutorial groups, working on their mixes on reference speakers, in order to become aware of the limitations of mixing on headphones, and to finalise their submissions.

Where mixing is taught in the classroom, access to adequate monitoring is required for demonstration purposes and for peer assessment in a group context.



## Indicative reading for learners

### Textbooks

- Bartlett B and Bartlett J – *Practical Recording Techniques* (Focal Press, 2008) ISBN 978-0240811444
- Benson, Whittaker and Whittaker – *Standard Handbook of Audio and Radio Engineering (McGraw-Hill Video/Audio Engineering S.)* (McGraw-Hill Education, 2001) ISBN 978-0070067172
- Crick T – *Recording Tips for Engineers, 2nd Edition* (Focal, 2005) ISBN 978-0240519746
- Eagle J – *The Microphone Book: From Mono to Stereo to Surround, A Guide to Microphone Design and Application* (Focal Press, 2005) ISBN 978-0240519616
- Gibson B – *Sound Advice on Microphone Techniques* (Music Sales, 2003) ISBN 978-1931140270
- Guerin R – *Inside the Recording Studio* (Course Technology, 2004) ISBN 978-1592001316
- Huber D and Runstein R – *Modern Recording Techniques* (Focal Press, 2005) ISBN 978-0240803081
- Mansfield R – *Studio Basics: What You Should Know Before Going into the Recording Studio* (Billboard Books, US, 1998) ISBN 978-0823084883
- Nisbett A – *The Sound Studio* (Focal, 2003) ISBN 978-0240519111
- Oswinski B – *The Mixing Engineers' Handbook* (Course Technology, 2006) ISBN 978-1598632514
- Rumsey F and McCormick T – *Sound & Recording* (Focal, 1997) ISBN 978-0240519968
- White P and Rocha M – *Basic Microphones* (SMT Books, 2002) ISBN 978-1860742651
- White P – *Basic Mixing Techniques* (SMT Books, 2002) ISBN 978-1860742835
- White P – *Basic Multitracking* (SMT Books, 2002) ISBN 978-1860742644
- White P – *Studio Recording Basics A (Basic Mixing Techniques, Effects & Processors, Multitracking & Mixers)* (Sanctuary, 2003) ISBN 978-1860744730

### Journals

*Music Tech*

*Sound On Sound*

*Tape Op*

### Websites

Audio.tutsplus.com

Audio Tuts+ blog

www.macprovideo.com

Mac Pro Video

www.musictechmag.co.uk

Music Technology Magazine

www.soundonsound.com

Sound on Sound magazine

## 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 ...
<b>Independent enquirers</b>	analysing manufacturers' specifications
<b>Creative thinkers</b>	problem solving in the recording studio
<b>Reflective learners</b>	responding to feedback during mixdown
<b>Team workers</b>	working with musicians
<b>Self-managers</b>	managing a recording session
<b>Effective participators</b>	taking part in recording sessions.

Although PLTS opportunities 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 ...
<b>Independent enquirers</b>	deciding on equipment set-ups
<b>Creative thinkers</b>	mixing multitrack recordings
<b>Reflective learners</b>	giving and receiving feedback in 'critique' sessions
<b>Team workers</b>	working in a supporting role during recording sessions
<b>Self-managers</b>	working within a timeframe
<b>Effective participators</b>	supporting other team members.

## ● Functional Skills – Level 2

Skill	When learners are ...
<b>ICT – Use ICT systems</b>	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	mixing multitrack projects using software
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	mixing multitrack projects using software
Manage information storage to enable efficient retrieval	mixing multitrack projects using software
Follow and understand the need for safety and security practices	mixing multitrack projects using software
Troubleshoot	mixing multitrack projects using software
<b>ICT – Find and select information</b>	
Select and use a variety of sources of information independently for a complex task	writing reports
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	writing reports
<b>ICT – Develop, present and communicate information</b>	
Enter, develop and format information independently to suit its meaning and purpose including: <ul style="list-style-type: none"> <li>• text and tables</li> <li>• images</li> <li>• numbers</li> <li>• records</li> </ul>	writing reports
Bring together information to suit content and purpose	writing reports
Present information in ways that are fit for purpose and audience	writing reports
Evaluate the selection and use of ICT tools and facilities used to present information	writing reports
Select and use ICT to communicate and exchange information safely, responsibly and effectively including storage of messages and contact lists	writing reports

Skill	When learners are ...
<b>English</b>	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	contributing to 'critique' based peer feedback sessions
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	writing reports.