

Unit 32: Sequencing Systems and Techniques

Unit code:	J/600/6945
QCF Level 3:	BTEC National
Credit value:	10
Guided learning hours:	60

● Aim and purpose

The aim of this unit is to develop learners' knowledge of music sequencing software and the transferable skills that facilitate the realisation of musical ideas in both audio and MIDI environments. Learners will develop the skills to set up, use and discuss sequencing systems and techniques.

● Unit introduction

The digital age has seen computers take centre stage in music production environments. The wealth of software tools and the power of computer-based systems has led to 'virtual studio' environments capable of producing recordings of a quality only previously available from expensive hardware-based systems, and at a fraction of the cost. However it is still vitally important music technologist to be able to connect and configure the additional hardware required to sequence successfully, including external sound sources.

MIDI and audio sequencing tools have put a vast range of creative possibilities into the hands of composers and performers of music, and created an environment where, alongside traditional composition methods, the manipulation of pre-existing sound is accepted as valid starting point for original creation.

In this unit learners will create a portfolio of music using the tools available with the major sequencing software packages. Learners will work with MIDI and audio-based sequencing, each of which has a vast range of techniques that can be utilised in the production of modern music. Learners will be expected to create a range of music that demonstrates how these tools can be applied. It is expected that those attempting this unit will be musically creative and can originate ideas using the software and hardware explored in this unit. They should be able to create musical ideas from a blank canvas, as well as manipulate pre-existing musical ideas with the intention of putting their individual stamp on the material they had been given to work with. As they create their portfolios, learners will develop their knowledge by incorporating a wide range of sequencing techniques, and will be able to make decisions as to the correct tool or skill for each situation.

● Learning outcomes

On completion of this unit a learner should:

- 1 Be able to set up a computer and peripheral MIDI hardware safely
- 2 Be able to realise musical ideas using MIDI sequencing skills
- 3 Be able to realise musical ideas using audio sequencing skills
- 4 Understand the terminology associated with music sequencing techniques.

Unit content

1 Be able to set up a computer and peripheral MIDI hardware safely

Hardware: eg keyboard, sound module, MIDI interface, controller keyboard, mixer, cables, computer, MIDI sequencing software

2 Be able to realise musical ideas using MIDI sequencing skills

MIDI sequencing skills: inputting MIDI data eg real-time performance, step-recording, clicking in; editing MIDI events eg inserting and deleting notes and events; pitch, note length, placement, velocity; quantization

Stylistic interpretation: tempo track; choosing and combining sounds; controlling expression eg track automation, MIDI controllers; controlling timbre eg automation of instrument parameters, filter cut-off

Arrangement: eg markers, control of structure, awareness of sections, building parts, control of texture, introduction, ending

3 Be able to realise musical ideas using audio sequencing skills

Audio sequencing skills: capturing and editing audio data eg recording audio files, cut, copy and paste techniques, loop manipulation, offline and online processing, software-sampling techniques, track automation

Stylistic interpretation: tempo track; manipulation of tempo eg time-stretching, slicing, beat-marking; choosing and combining sounds; controlling expression eg track automation; controlling timbre eg automation of instrument parameters, filter cut-off

Arrangement: eg markers, control of structure, awareness of sections, building parts, control of texture, introduction, ending

4 Understand the terminology associated with music sequencing techniques

Terminology relating to generic techniques: recording MIDI; editing MIDI; recording audio; editing audio; instrument editing; mixing; external and internal control; bouncing down

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 set up a computer and peripheral MIDI hardware safely and competently with limited tutor support [IE, CT, SM]	M1 set up a computer and peripheral MIDI hardware safely and competently with total independence	D1 set up a computer and peripheral MIDI hardware safely and competently demonstrating mastery of the processes involved
P2 realise musical ideas using MIDI sequencing skills [CT, RL, SM, EP]	M2 realise musical ideas using MIDI sequencing skills competently	D2 realise musical ideas using MIDI sequencing skills with confidence and flair
P3 realise musical ideas using audio sequencing skills [CT, RL, SM, EP]	M3 realise musical ideas using audio sequencing skills competently	D3 realise musical ideas using audio sequencing skills with confidence and flair
P4 explain the terminology associated with music sequencing techniques. [IE, RL, SM]	M4 illustrate the terminology associated with music sequencing techniques.	D4 analyse the terminology associated with music sequencing techniques.

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

This unit is aimed at developing music producers and performers. The essential role of computer-based systems in contemporary music production should be explored in depth, and learners encouraged to focus on the practical benefits of a high level of familiarity with the technology and techniques involved. The exploration of the tools and techniques available to users of sequencing programs will underline their essential role in the creation of modern music. Please note – terminology varies from software to software; refer to the manual and training materials.

This unit should be delivered in practical workshop sessions. Learners should have access to up-to-date audio/MIDI sequencing software that provides a wide range of functionality including timeline-based audio/MIDI sequencing, detailed editing of audio and MIDI data and a wide range of built-in resources (MIDI and audio loops and samples, instruments, effects, etc). Learners should have sufficient access to sequencing facilities outside of contact time to enable them to develop the evidence required to satisfy the unit.

Learners will also need access to external MIDI hardware including sound sources and MIDI interfaces as well as MIDI controller keyboards in order to gain experience of connecting and configuring MIDI sequencing systems. It is unlikely that most centres will have the resources to deal to supply all the hardware required for individual learners to have access to a complete setup so a learning plan should be developed that allows all learners access to appropriate equipment where there are limitations. It may be possible to organise rotational access to external MIDI sound sources and equipment while remaining learners are working on the portfolio element of this unit.

Group sizes should be kept to a level that allows tutors to engage in regular contact with learners who may be spending significant amounts of time isolated through headphone use. A classroom management system should be in place that supports this style of activity. It is therefore essential that the whole group balance individual learning with regular reviews of work in progress. Reflective and peer review will inform this process as well as the creation of the portfolio itself.

It is likely that some learner project work will provide evidence that will meet more than one outcome. It is probable that work of this nature will take place in the later stages of the unit, after a range of techniques has been learnt. A portfolio containing a range of music appropriate for each individual learning outcome is an alternative way of satisfying higher levels of the grading criteria. By this stage learners will be creating projects that use a wide variety of MIDI and audio resources and should, therefore, be aware of how to backup and transfer their work.

Learners must be encouraged all times to gather the evidence required for the final outcome while they are creating their portfolios, and tutors should include this evidence-gathering as a formal part of each lesson.

Finally, learners should be encouraged to 'practise' their sequencing skills wherever possible. It is vital that they see how the ability to use a sequencing program underscores much of the work they will be undertaking in other units.

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.
Connecting and configuring a MIDI studio – learning outcome 1; tutor-led workshops in: <ul style="list-style-type: none">identifying componentsconnecting componentsconfiguring software and hardwaretesting the setup.
Assignment 1: Setting up Computer-based MIDI Systems – P1, M1, D1
Tutor observed practical assessment.
Using MIDI/audio sequencing software to create a portfolio of work – learning outcome 2; tutor-led workshops to cover: <ul style="list-style-type: none">MIDI sequencing techniquescreating a portfoliopeer and tutor feedback.
Using MIDI/audio sequencing software to create a portfolio of MIDI and audio-based work – learning outcome 3; tutor-led workshops to cover: <ul style="list-style-type: none">audio sequencing techniquescreating a portfoliopeer and tutor feedback.
Assignment 2: Sequencing Portfolio – P2, M2, D2, P3, M3, D3
Learner practical work/resource-based learning.
Understanding the terminology of sequencing – learning outcome 4; tutor-led workshops to cover: <ul style="list-style-type: none">terminologyworking with screenshots.
Assignment 3: Sequencing Report – P4, M4, D4
Learner practical work/resource-based learning.
Review unit and assignments.

Assessment

The musical applications of sequencing can be many and varied but it should be remembered that it is the application of sequencing techniques that is being assessed rather than compositional skills, which are covered in other units. Therefore a musically successful composition that makes little use of sequencing techniques (an unedited recording of a free-form improvisation for example) is not likely to achieve the higher grades.

Learning outcome 1 will be evidenced by tutor observation of learner demonstration. For PI, learners will successfully connect and configure the provided equipment, which should include a MIDI interface and sound source external to the computer. A means by which the success of configuration can be heard should be provided, for example of small mixer through which sound from the computer and the external sound source can be monitored. The degree of independence with which the learner is able to complete the process should be recorded by tutor observation in order to distinguish between those meeting grading criteria one at pass level and those working at merit level. Tutor questioning can be used to determine the level of learner understanding, necessary to assess grading criteria one at distinction level. An alternative would be for learners to provide an annotated diagram of the setup that they have connected, showing signal type and direction of flow as well as MIDI socket names.

Learning outcomes 2 and 3 require the creation of a portfolio of music using sequencing techniques. In order to address grading criteria 2 and 3 at pass level learners should demonstrate each skill listed in the unit content. In order to give clear guidance a checklist could be provided in both the assignment brief design and feedback form. Evidence for grading criteria 2 and 3 at merit level will show that learners are applying sequencing techniques in ways that are musically appropriate, and that they are beginning to use alternative techniques to achieve equivalent results. Distinction level learners will demonstrate mastery of all sequencing skills listed in the unit content, to the extent that their music demonstrates imagination, creativity and flair that is not inhibited by technical limitation.

Assessment evidence is likely to comprise a portfolio of music that demonstrates that the grading criteria have been achieved. An approach that involves a number of small introductory assignments targeting a discrete set of techniques, eg MIDI or audio, will quickly allow learners to collect a range of evidence. Giving members the opportunity work with given material at the beginning of the course may take away the added burden of original composition, allowing the focus to rest solely on required techniques. The notion of creating original material may be introduced later once confidence with the techniques has been established. In this way, criteria may be revisited with later assignments and allowing higher grading to be addressed.

The evidence for learning outcome 4 will be provided by the demonstration of understanding of sequencing terminology. For PI, learners will provide simple unelaborated explanations of the specified terminology (see unit content). At merit level these explanations will be supported by reference to tools found in the sequencing software. Distinction level learners will be assessing the success with which each tool performs its function, and comparing different methods of achieving similar results (eg the control of volume using track automation compared with MIDI continuous controllers), referring correctly to the terminology at all times to support their arguments.

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	Setting up a Computer-based MIDI System	Connect and configure the elements of a computer-based MIDI system using appropriate cables, with strict adherence to Health and Safety guidelines.	Evidence to include: <ul style="list-style-type: none"> tutor observation report video evidence annotated diagram.
P2, M2, D2 P3, M3, D3	Sequencing Portfolio (Alternatively – this assignment can be broken into two, one for each learning outcome; additionally introductory assignments that address lower grades only could also be offered at the start of the unit.)	Create a portfolio of music, containing a minimum of one project based on MIDI techniques and one project based on audio techniques.	Evidence to include: <ul style="list-style-type: none"> portfolio CD with projects bounced to stereo audio files data CD with project saved in native format (the sequencer project/session file) together with all required assets (audio files, samples, etc).
P4, M4, D4	Sequencing Report	Prepare a written report detailing the techniques used in the creation of their portfolios.	Evidence to include: <ul style="list-style-type: none"> written report appropriate screenshots.

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
	Exploring Computer Systems used by Musicians	Composing Music
		Sequencing Systems and Techniques
		Sound Creation and Manipulation
		Music and Sounds for Multimedia
		Working with Music Notation Packages

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

Technical Theatre

- CPDI – Improving your skills
- HSI – Working safely.

Essential resources

For the majority of the unit, learners will need classroom/workshop sessions where they are able to apply the skills demonstrated by their tutor in the preparation of their own work, and request assistance where appropriate. Classrooms will need to be equipped to an appropriate standard, with modern, reliable computers running up-to-date audio/MIDI sequencing software that provides a wide range of functionality including timeline-based audio/MIDI sequencing, detailed editing of audio and MIDI data and a wide range of built-in resources (MIDI and audio loops and samples, instruments, effects, etc), access to adequate monitoring for demonstration and private study, projection and printing facilities.

A range of external hardware (including sound sources) should be available, together with MIDI controller keyboards, appropriate cables and means by which the sounds produced by both computer and external sound sources can be monitored.

The classroom will also need facilities for the creation of written reports utilising screenshots, or equivalent.

Indicative reading for learners

Textbooks

Collins M – *Pro Tools 8, Music production, Recording, Editing and Mixing* (Focal Press, 2009)
ISBN 978-0240520759

Digidesign – *ProTools 101 Official Courseware* (Thomson Course Technology, 2009) ISBN 978-1598638660

Gomel K – *Cubase 5 Tips and Tricks* (PC Publishing, 2009) ISBN 978-1906005139

McConnon B – *Power Tools for Cubase 5* (Music Pro Guides, 2009) ISBN 978-1423474531

Millard S – *Fast Guide to Cubase 5* (PC Publishing, 2009) ISBN 978-1906005146

Nahant D – *Apple Pro Training Series: Logic Pro 9 and Logic Express 9* (Peachpit Press, 2009)
ISBN 978-0321636805

Shimoninski R – *ProTools 8 Kit, The Complete Professional Workflow for Music Production* (Focal Press, 2009)
ISBN 978-0240811154

Journals

Computer Music

MusicTech

Sound on Sound

Websites

<http://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 ...
Independent enquirers	setting up MIDI equipment
Creative thinkers	realising music using sequencing software
Reflective learners	responding to feedback during the creative process
Self-managers	working towards a deadline
Effective participators	planning creative projects.

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	writing reports
Creative thinkers	setting up MIDI systems
Reflective learners	responding to feedback on their report writing
Self-managers	working on more than one assignment at the same time
Effective participators	deciding how to use sequencing skills to realise their creative ideas.

● 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	realising music using sequencing software
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	realising music using sequencing software
Manage information storage to enable efficient retrieval	realising music using sequencing software
Follow and understand the need for safety and security practices	configuring MIDI software
Troubleshoot	configuring MIDI software
ICT – Find and select information	
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
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 	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
English	
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.