



## Higher National Unit Specification

### General information

**Unit title:** Sound Production: Spatial Recording and Reproduction (SCQF level 8)

**Unit code:** J01G 35

**Superclass:** XL

**Publication date:** May 2018

**Source:** Scottish Qualifications Authority

**Version:** 01

### Unit purpose

This unit is designed to give learners a clear knowledge and advanced understanding of spatial recording and reproduction techniques. It will prepare them to undertake complex recording tasks, from a brief. It will provide them with the practical skills involved in spatial microphone techniques, recording and accurate replay of audio sources.

This unit is intended primarily for learners who are interested in pursuing a career in sound production where the use of spatial recording and reproduction is a key component of the job, eg recording engineer, preparing audio for broadcast, audio-visual and multi media production.

### Outcomes

On successful completion of the unit the learner will be able to:

- 1 Produce and document a range of spatial recordings in response to a brief.
- 2 Reproduce a range of spatial recordings in response to a brief.
- 3 Prepare pre-production stems in response to a brief.
- 4 Evaluate a range of spatial recordings.

### Credit points and level

2 Higher National Unit credits at SCQF level 8: (16 SCQF credit points at SCQF level 8)

## Higher National Unit Specification: General information (cont)

**Unit title:** Sound Production: Spatial Recording and Reproduction (SCQF level 8)

### Recommended entry to the unit

Access to this unit will be at the discretion of the centre, however, it would be beneficial if learners had completed the unit *Sound Production: Audio Skills* (SCQF level 7).

### Core Skills

Achievement of this unit gives automatic certification of the following Core Skills components:

Complete Core Skill	None
Core Skill component	Critical Thinking at SCQF level 6 Planning and Organising at SCQF level 6 Providing/Creating Information at SCQF level 6

There are also opportunities to develop aspects of Core Skills which are highlighted in the support notes of this unit specification.

### Context for delivery

This is a mandatory unit in the framework for HNC/HND Sound Production. It is recommended that it should be taught and assessed within the subject area of the group award to which it contributes.

The Assessment Support Pack (ASP) for this unit provides assessment and marking guidelines that exemplify the national standard for achievement. It is a valid, reliable and practicable assessment. Centres wishing to develop their own assessments should refer to the ASP to ensure a comparable standard. A list of existing ASPs is available to download from SQA's website (<http://www.sqa.org.uk/sqa/46233.2769.html>).

### Equality and inclusion

This unit specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence.

Further advice can be found on our website [www.sqa.org.uk/assessmentarrangements](http://www.sqa.org.uk/assessmentarrangements).

## Higher National Unit Specification: Statement of standards

**Unit title:** Sound Production: Spatial Recording and Reproduction  
(SCQF level 8)

Acceptable performance in this unit will be the satisfactory achievement of the standards set out in this part of the unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

### Outcome 1

Produce and document a range of spatial recordings in response to a brief.

#### Knowledge and/or skills

- ◆ Session planning
- ◆ Microphone selection and placement
- ◆ Spatial microphone arrays
- ◆ Spot microphone techniques
- ◆ Binaural
- ◆ Recording session management
- ◆ Monitoring of multi-channel audio

### Outcome 2

Reproduce a range of spatial recordings in response to a brief.

#### Knowledge and/or skills

- ◆ System configuration
- ◆ System calibration
- ◆ De-coding audio signals
- ◆ Signal routing, bussing and panning
- ◆ Equalisation, time alignment and ambient processing

### Outcome 3

Prepare pre-production stems in response to a brief.

#### Knowledge and/or skills

- ◆ File handling
- ◆ Session management
- ◆ Discrete and interleaved files
- ◆ Metering standards
- ◆ Loudness
- ◆ Exporting audio to a range of formats

## Higher National unit specification: Statement of standards (cont)

**Unit title:** Sound Production: Spatial Recording and Reproduction  
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### Outcome 4

Evaluate a range of spatial recordings.

#### Knowledge and/or skills

- ◆ Critical listening
- ◆ Critical analysis
- ◆ Recording and reproduction methods

#### Evidence requirements for this unit

Learners will need to provide evidence to demonstrate their knowledge and/or skills across all outcomes by showing that they can:

#### Outcome 1 — Produce and document a range of spatial recordings in response to a brief

Learners must provide product and performance evidence to demonstrate that they can:

- ◆ carry out and document the production of two multi-microphone or multi-capsule spatial recordings.

Product evidence will include, as a minimum; floor plan showing microphone placement, distance between microphones, angles and height of microphones in relation to source; channel assignment, microphone selection and equipment list and settings.

Product evidence must also include a minimum of two recordings which utilise multi-microphone spatial techniques and/or binaural and/or multi-channel spatial techniques. At least one technique will require the learner to consider the impact of microphone placements on phase coherence, eg a technique which involves multiple microphones. At least one technique will require the learner to utilise spot microphones to augment the main array.

Learners must submit session and audio files of each recording.

Assessor observation checklists must be used to record a learner's ability to select and place microphones appropriately in relation to the sound source being recorded and monitor the signals coming into the recording system.

Assessor observation checklists must be used to record a learner's ability to effectively conduct the recording session.

## Higher National unit specification: Statement of standards (cont)

**Unit title:** Sound Production: Spatial Recording and Reproduction (SCQF level 8)

### **Outcome 2 — Reproduce a range of spatial recordings in response to a brief**

Learners must provide product and performance evidence to demonstrate that they can:

- ◆ configure a system to ensure accurate reproduction of at least two spatial recordings.

Product evidence will include a system diagram indicating speaker positioning and relationships in terms of angle, distance and height.

Learners must provide product evidence in the form of a session file which indicates appropriate time aligning of spot microphones, de-coding, routing, bussing, panning and application of equalisation and ambient processing (such as addition of reverbs) of audio signals of at least two spatial recordings.

An observation checklist must be used to record a learner's ability to; appropriately calibrate and position system components in order that spatial recordings can be reproduced accurately; appropriately reproduce spatial recordings.

### **Outcome 3 — Prepare pre-production stems to meet a brief**

Learners must provide product evidence to demonstrate that they can:

- ◆ in response to a given brief, prepare a range of pre-production stems.

Product evidence must include pre-production audio files for two spatial recordings which as a minimum will include for each recording:

- ◆ Multiple discrete stems, for example, L, C, R, LS, RS
- ◆ Interleaved multi-channel audio file
- ◆ A 2.0 downmix

Learners will utilise appropriate metering to ensure that all audio conforms to current standards for identified destination.

Learners will utilise appropriate session management and file naming conventions.

### **Outcome 4 — Evaluate a range of spatial recordings**

Learners must provide product and written and/or oral evidence to demonstrate that they can:

- ◆ critically evaluate two spatial recordings and reproductions.

## Higher National unit specification: Statement of standards (cont)

**Unit title:** Sound Production: Spatial Recording and Reproduction  
(SCQF level 8)

Evaluations must consider the following:

- ◆ Explanation of the techniques used to capture audio sources
- ◆ Effectiveness of the microphone selection and techniques on recordings
- ◆ Impact of physical environment on the recording
- ◆ Explanation of systems and processes used to reproduce audio sources
- ◆ Effectiveness of system and processes on the reproduction of spatial audio
- ◆ Suggestions for improvements or enhancements in relation to recording and/or reproduction methods

Product evidence will include a simple layout diagram of the listening space.

It is recommended that this unit is taught and assessed sequentially. Each outcome should be assessed separately.

Evidence for all outcomes will be carried out under open-book conditions.



## Higher National unit Support Notes

**Unit title:** Sound Production: Spatial Recording and Reproduction  
(SCQF level 8)

Unit support notes are offered as guidance and are not mandatory.

While the exact time allocated to this unit is at the discretion of the centre, the notional design length is 80 hours.

### Guidance on the content and context for this unit

This unit is designed to give learners a clear knowledge and advanced understanding of spatial recording and reproduction. It will prepare them to undertake complex recording tasks, from a brief. It will provide them with the practical skills involved in spatial microphone techniques, recording and accurate replay of audio sources. This unit is intended primarily for learners who are interested in pursuing a career in sound production where the use of spatial recording and reproduction techniques is a key component of the job, for example, recording engineer, preparing audio for broadcast, audio-visual and multimedia production.

Outcome 1 focuses on multi-microphone and multi-capsule approaches to spatial recording. In terms of this unit, multi-capsule approaches refers to microphones capable of capturing complex spatial information, for example, A or B format. It is important, however, that if centres do have access to such equipment, it is not used instead of multi-microphone approaches but to compliment and provide breadth to a learner's experience.

It is expected that centres will introduce learners to a range of approaches to capture spatial audio for the purposes of reproducing it over more than two loudspeakers.

Microphone arrays should include; techniques which require the combination of coincident and spaced microphones; near coincident and spaced arrangements; binaural; spaced arrays and spot microphones to reinforce aspects of the main array.

Learners will be asked to document the recording process through the production of a floor plan for reference and document channel assignment, microphone selection as well details and settings of any ancillary equipment. Learners should be encouraged to detail channel assignment and microphone selection in the notes field of a DAW channel, for example. Efficient session management is, therefore, encouraged throughout the unit. It would be beneficial for the learners to experience formative activity in advance of the assessment event in order that they may, for example, arrive at a location recording session prepared and with sufficient equipment or be able to select appropriate microphones and techniques for a studio based session.

## Higher National Unit Support Notes (cont)

**Unit title:** Sound Production: Spatial Recording and Reproduction (SCQF level 8)

Outcome 2 requires learners to configure a system to ensure accurate reproduction of at least two spatial recordings which have utilised two different techniques. Learners will produce a simple system diagram which indicates speaker positioning relative to the listener. Speaker positioning details should also include information about angle and distance relative to the other speakers and speaker heights.

Learners should then calibrate a multi speaker system using appropriate equipment, for example a dB SPL meter, measuring tape, protractor, reference noise, etc.

Learners would then be expected to, de-code audio (if appropriate to the technique) route audio to appropriate loudspeakers and apply equalisation, ambient processing and time alignment of spot microphones to enhance the reproduction of the spatial audio. Learners should then demonstrate the resultant spatial reproduction.

It may be appropriate to use the same system to reproduce the two recordings.

Outcome 3 focuses on the creation of pre-production stems. Learners would be expected to respond to a brief where they are asked, for example, to prepare for the delivery of audio for the purposes of dubbing to picture. It would, therefore, be appropriate to introduce learners to current metering standards and workflow. It would be expected that centres would cover dB and loudness including LU and LUFS. In addition, types of metering should extend to those which are currently utilised in industry. At the time of writing these would include VU, PPM, True Peak as well as other digital metering such as LU and LUFS.

This outcome requires the production of a range of stems for identified applications, such as a computer game, TV or film. Learners should be able to create either interleaved and discrete files, or a combination of both depending on the demands of the brief. Learners should use methodical final file naming to, for example, clearly identify channel associations of discrete files.

Outcome 4 requires the learners to provide written and/or oral evidence to demonstrate that they can critically evaluate two spatial recordings and reproductions. It is recommended that these will be recordings that they have produced, giving them detailed insight into the techniques and processes involved. It may be appropriate for the learners to prepare a short presentation that addresses the knowledge and skills and evidence requirements. The presentation may include excerpts of recordings and reproductions. Furthermore, a simple layout diagram of the listening space should be provided which shows position and nature of any acoustic treatment or problematic surfaces in the room.

This unit offers the potential for aspects of the following National Occupational Standards to be demonstrated:

CCSMT32 Produce surround sound for film and audio



## Higher National Unit Support Notes (cont)

**Unit title:** Sound Production: Spatial Recording and Reproduction  
(SCQF level 8)

### Guidance on approaches to delivery of this unit

This unit is designed to develop learner's practical skills, knowledge and understanding of advanced techniques employed in sound production. The unit is designed to develop an understanding of sound production theory and practice. It is important, therefore, that learning and teaching should be carried out through demonstrations and practical exercises. Lessons should be learner-centred and participative through use of practical approaches.

Although the unit is highly practical, it is important that the development of learner's theoretical understanding is emphasised, and as such, learners should be given the opportunity to reflect on what theoretical knowledge they are acquiring and how this knowledge will inform their practice. This is particularly important in Outcome 4 where learners are asked to critically evaluate recording and reproduction techniques. This will require learners to exhibit a deeper understanding of, for example, resultant recordings and adopted approaches.

Learning should take place in environments where learners are likely to employ their skills such as studios and performance spaces.

### Guidance on approaches to assessment of this unit

Evidence can be generated using different types of assessment. The following are suggestions only. There may be other methods that would be more suitable to learners.

Centres are reminded that prior verification of centre-devised assessments would help to ensure that the national standard is being met. Where learners experience a range of assessment methods, this helps them to develop different skills that should be transferable to work or further and higher education.

It is recommended that the outcomes are taught and assessed sequentially; however, it may be appropriate to issue learners with a brief which sets the scene for Outcomes 1, 2 and 3. The tasks for each outcome, however, should be issued separately.

Assessment for each outcome will be carried out under controlled conditions. The observation of learner activity will ensure authenticity of their work.

It may be possible that learners work in teams to produce recordings or calibrate systems. It would, however, be crucial that each learner provides individual session data and documentation for Outcome 1, system diagrams for Outcome 2 and mixes for Outcome 3. Assessors should be confident that learners have grasped knowledge and skills when making decisions relating to learner performance when working in teams.

For Outcome 1 — Floor plans and details of microphone arrangements could be carried out retrospectively. Microphone channel assignments and details of microphone type could be evidenced within a session file, eg in the notes field of an appropriately labelled channel. The notes could also include details of ancillary equipment such as pre-amp type and settings.

Outcome 4 should be assessed separately and individually.

## Higher National Unit Support Notes (cont)

**Unit title:** Sound Production: Spatial Recording and Reproduction  
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### Opportunities for e-assessment

E-assessment may be appropriate for some assessments in this unit. By e-assessment we mean assessment which is supported by Information and Communication Technology (ICT), such as e-testing or the use of e-portfolios or social software. Centres which wish to use e-assessment must ensure that the national standard is applied to all learner evidence and that conditions of assessment as specified in the evidence requirements are met, regardless of the mode of gathering evidence. The most up-to-date guidance on the use of e-assessment to support SQA's qualifications is available at [www.sqa.org.uk/e-assessment](http://www.sqa.org.uk/e-assessment).

### Opportunities for developing Core and other essential skills

This unit has the Critical Thinking and the Planning and Organising components of *Problem Solving* embedded in it. This means that when learners achieve the unit, their Core Skills profile will also be updated to show they have achieved Critical Thinking at SCQF level 6 and Planning and Organising at SCQF level 6.

This unit has the Providing/Creating Information component of *Information and Communication Technology (ICT)* embedded in it. This means that when learners achieve the unit, their Core Skills profile will also be updated to show they have achieved Providing/Creating Information at SCQF level 6.

During this unit there will also be opportunities for learners to develop Core Skills such as *Communication, Numeracy, Working with Others* and other aspects of *Problem Solving* and *Information and Communication Technology (ICT)*.

## History of changes to unit

Version	Description of change	Date

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## General information for learners

### **Unit title:** Sound Production: Spatial Recording and Reproduction (SCQF level 8)

This section will help you decide whether this is the unit for you by explaining what the unit is about, what you should know or be able to do before you start, what you will need to do during the unit and opportunities for further learning and employment.

This unit is designed to give you clear knowledge and advanced understanding of spatial recording and reproduction techniques. It will prepare you to undertake complex recording tasks, from a brief, by providing you with the practical skills involved in spatial microphone techniques, recording and accurate replay of audio sources.

This unit is intended primarily for those who are interested in pursuing a career in sound production where the use of spatial recording and reproduction techniques is a key component of the job, for example, recording engineer, preparing audio for broadcast, audio-visual and multimedia production.

During this unit you will be expected to carry out a range of recordings which utilise multi-microphone spatial arrays. You will learn how to set up a range of arrays in order that you can select the appropriate methods for recordings you may wish to undertake.

The next stage of the process will require you to calibrate and position system components in order that the spatial recordings can be accurately reproduced. You will be expected to take your recordings and demonstrate their reproduction over loudspeakers.

You will respond to a brief to prepare a range of audio files for a specified purpose. For example, you may be asked to generate audio stems for destinations such as broadcast or computer games. You will learn about current metering standards and delivery formats.

Once your recordings have been carried out, reproduced and prepared for delivery, you will then critically evaluate all stages of the production process.

In addition to the development of practical skills and knowledge, this unit will help to develop theoretical knowledge and understanding of sound production through the practical application of skills.

Assessment will take place throughout the unit at appropriate points. You will respond to a brief which will require you to record, reproduce and deliver a range of spatial recordings. Finally you will critically evaluate all stages of the production process by either written or oral means.

This unit has the Critical Thinking and the Planning and Organising components of *Problem Solving* embedded in it. This means that when you achieve the unit, your Core Skills profile will also be updated to show you have achieved Critical Thinking at SCQF level 6 and Planning and Organising at SCQF level 6.

This unit has the Providing/Creating Information component of *Information and Communication Technology (ICT)* embedded in it. This means that when you achieve the unit, your Core Skills profile will also be updated to show you have achieved Providing/Creating Information at SCQF level 6.

During this unit there will also be opportunities for you to develop Core Skills such as *Communication, Numeracy, Working with Others* and other aspects of *Problem Solving* and *Information and Communication Technology (ICT)*.