



## National Unit Specification: general information

**UNIT**      Sound: Reinforcement (SCQF level 6)

**CODE**      F5E0 12

### SUMMARY

In this Unit candidates will have the opportunity to learn about the components of sound reinforcement systems and develop practical skills in the safe connection and operation of simple sound reinforcement systems, ie Public Address (PA) systems. This is essentially a practical Unit in which candidates will be required to connect and operate a simple sound reinforcement system for a small-scale event.

This Unit is an optional Unit within the National Certificate in Music (SCQF level 6) and the National Certificate in Sound Production (SCQF level 6), but can also be taken as a free-standing Unit.

This Unit is suitable for candidates with an interest in live sound. No prior knowledge or experience of sound reinforcement systems is necessary.

### OUTCOMES

- 1 Explain the function of, and relationship between, essential components of sound reinforcement systems.
- 2 Assemble, test, and disassemble a simple sound reinforcement system according to a brief.
- 3 Connect and operate a simple sound reinforcement system for a small-scale event according to a brief.

### RECOMMENDED ENTRY

Entry is at the discretion of the centre.

---

#### Administrative Information

**Superclass:**      XL

**Publication date:**    February 2009

**Source:**              Scottish Qualifications Authority

**Version:**             01

© Scottish Qualifications Authority 2009

This publication may be reproduced in whole or in part for educational purposes provided that no profit is derived from reproduction and that, if reproduced in part, the source is acknowledged.

Additional copies of this Unit Specification can be purchased from the Scottish Qualifications Authority. Please contact the Customer Contact Centre, telephone 0845 279 1000.

## **National Unit Specification: general information (cont)**

**UNIT**      Sound: Reinforcement (SCQF level 6)

### **CREDIT VALUE**

1 credit at Higher (6 SCQF credit points at SCQF level 6\*).

*\*SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

### **CORE SKILLS**

There is no automatic certification of Core Skills in this Unit.

The Unit provides opportunities for candidates to develop aspects of the following Core Skills:

- ◆ Communication
- ◆ Problem Solving

These opportunities are highlighted in the Support Notes of this Unit Specification.

## **National Unit Specification: statement of standards**

### **UNIT      Sound: Reinforcement (SCQF level 6)**

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**

Explain the function of, and relationship between, essential components of sound reinforcement systems.

##### **Performance Criteria**

- (a) Identify the essential components of sound reinforcement systems.
- (b) Explain the function of each component.
- (c) Identify the cable and connector types between each device.
- (d) Describe the signal flow through the sound reinforcement system.

#### **OUTCOME 2**

Assemble, test, and disassemble a simple sound reinforcement system according to a brief.

##### **Performance Criteria**

- (a) Select correct components.
- (b) Correctly connect components to create a simple sound reinforcement system.
- (c) Carry out a visual inspection of the system prior to system power up to identify and correct errors.
- (d) Safely connect sound reinforcement system to the mains supply.
- (e) Power up components in the correct sequence.
- (f) Test system inputs and outputs to ensure they are correctly functioning.
- (g) Correctly disassemble the sound reinforcement system.
- (h) Comply fully with health and safety requirements.

## National Unit Specification: statement of standards (cont)

**UNIT**      Sound: Reinforcement (SCQF level 6)

### OUTCOME 3

Connect and operate a simple sound reinforcement system for a small-scale event according to a brief.

#### Performance Criteria

- (a) Connect sound sources to the system.
- (b) Select appropriate microphone(s) and placement technique(s).
- (c) Ensure system and cable runs satisfy Health and Safety requirements.
- (d) Organise the sound-checking procedure for all sound sources.
- (e) Adjust channel input gains as required.
- (f) Apply panning and equalisation mixing techniques to achieve an even stereo balance.
- (g) Apply time domain effects to channels.
- (h) Balance sound sources to ensure comfortable listening levels.
- (i) Visually monitor and adjust input and output levels to maintain optimum signal levels.
- (j) Aurally monitor and adjust input and output levels to maintain optimum signal levels.

#### EVIDENCE REQUIREMENTS FOR THIS UNIT

Evidence is required to demonstrate that candidates have achieved all Outcomes and Performance Criteria.

##### Outcome 1

The candidate is required to produce written and/or oral evidence which demonstrates that they can identify and explain the function of the following components of sound reinforcement systems:

<b>Devices</b>	Mixing desk Amplifier and loudspeaker systems (front of house) Amplifier and loudspeaker systems (foldback) Time domain effects Microphones Direct injection boxes Line sources*
<b>Cables</b>	Unscreened Unbalanced Balanced
<b>Connectors</b>	Phono Jack XLRm XLRf Speakon

\*Line sources may include electronic music keyboards, CD decks, turntables etc, or for testing purposes, a CD player, or other playback device.

## National Unit Specification: statement of standards (cont)

### UNIT      Sound: Reinforcement (SCQF level 6)

Candidates will also be required to describe the signal flow through the sound reinforcement system. Candidates must identify each of the components and clearly describe the signal path within the system.

This evidence will be gathered under open-book conditions at appropriate points in the Unit.

#### Outcomes 2 and 3

The candidate is required to produce performance evidence, supplemented by an Assessor Observation Checklist, showing their ability to select, connect, test and operate components of a sound reinforcement system.

As a minimum requirement, the sound reinforcement system that candidates connect, test, and operate must include at least:

- ◆ a 4-channel mixer
- ◆ front of house loudspeaker system
- ◆ foldback/monitor loudspeaker system
- ◆ one microphone
- ◆ one line-level source\*
- ◆ one time domain effects processor (this should be connected via auxiliary inputs)
- ◆ 2-band shelving EQ

\*This could be covered by the connection and use of an audio playback device for background music. However, the sound sources are likely to be more varied for a music event or gig and may include a mixture of mic and line sources.

Candidates must connect components in a systematic manner while adhering to health and safety guidelines.

In order to assess Outcome 2 Performance Criterion (c) the candidate will be presented with a sound reinforcement system which has a single faulty component. The candidate will be required to carry out a visual inspection of the system to trace the malfunction to a specific component, cable, or connection and resolve the fault.

When operating the sound reinforcement system candidates will be required to organise the sound-checking procedure for all sound sources to ensure smooth running of the system during the event. They will also be required to adjust:

- ◆ channel input gain and output levels
- ◆ two band EQ controls
- ◆ pan controls

They must apply a minimum of one time domain effect to at least one channel, balance sound sources to ensure comfortable listening levels, and monitor and adjust input and output levels visually (by observing meters and light indicators) and aurally to maintain optimum signal levels.

## **National Unit Specification: statement of standards (cont)**

### **UNIT        Sound: Reinforcement (SCQF level 6)**

Outcomes 2 and 3 will be assessed at appropriate points during the Unit under supervised conditions. The evidence for Outcomes 2 and 3 can be produced over an extended period of time but the assessor must authenticate that the evidence produced is the candidate's own work. An assessor checklist is required which authenticates that candidates have completed the above tasks. An assessor must endorse each candidate checklist with their name, signature and date.

## **National Unit Specification: support notes**

### **UNIT        Sound: Reinforcement (SCQF level 6)**

This part of the Unit Specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

#### **GUIDANCE ON THE CONTENT AND CONTEXT FOR THIS UNIT**

This Unit is an optional Unit within the National Certificate in Music (SCQF level 6) and the National Certificate in Sound Production (SCQF level 6), but can also be taken as a free-standing Unit.

This Unit is designed to develop the candidate's knowledge and understanding of the use of sound reinforcement systems. The Unit should also allow candidates to draw comparisons with related sectors such as studio and broadcast. Candidates have the opportunity to gain experience in system specification and set-up as well as 'live' mixing of sound sources for a small-scale event. This event could be a small music concert or a conference, and may be simulated if necessary.

Outcome 1 calls for candidates to demonstrate an understanding of system signal flow. Whilst standard practice is that this would take the form of a block diagram, in certain situations it may be acceptable for candidates to describe orally or in writing their understanding of the signal path.

Outcomes 2 and 3 should allow candidates to develop a systematic work ethic in component selection and system set-up. It will also develop an awareness of some of the main health and safety issues when using sound amplification systems.

Relevant health and safety information should be introduced early in the Unit and candidates should be made aware of the importance of following all relevant health and safety procedures at all times.

Candidates may benefit from some prior knowledge of the live audio sector. Knowledge of the range of possible roles and the associated skills would be extremely beneficial.

#### **GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT**

For all Outcomes, candidates will benefit from viewing the operation of a wide range of systems that vary in complexity. This may be achieved by watching footage of large-scale events or by visiting local venues to see installed systems. It would also be beneficial if centres were able to arrange visits from sound engineers who work in the live sector to talk to candidates about their work. Such visits may help candidates appreciate both technical roles and the varying purpose and complexity of sound reinforcement systems.

Candidates will benefit from viewing simple conference systems, medium/large installed sound reinforcement systems, small/medium portable systems, and medium/large touring systems. This will allow candidates to see how a variety of components can fulfil broadly similar functions.

The majority of the time should be spent on Outcomes 2 and 3 to ensure that candidates are primarily engaged in practical work and to consolidate their skills base and confidence in the selection and connection of sound reinforcement systems.

## National Unit Specification: support notes (cont)

### UNIT      Sound: Reinforcement (SCQF level 6)

In Outcome 2 candidates should connect components in a systematic manner with concern over health and safety issues, such as potential slipping and tripping hazards.

Outcome 3 should allow candidates to develop skills in controlling sound in a live context. The live event could be a music event, gig, or conference. It would be appropriate for the candidate to work in a team for both Outcomes 2 and 3, where each candidate takes it in turn to take manage and organise the sound reinforcement system for the event and delegates tasks as required.

Generic system components could be drawn from the following:

<b>Devices</b>	Mixing desk Amplifier and loudspeaker systems (front of house) Amplifier and loudspeaker systems (foldback) Time domain effects Microphones Direct injection boxes Line sources*
<b>Cables</b>	Unscreened Unbalanced Balanced
<b>Connectors</b>	Phono Jack XLRm XLRf Speakon
<b>Mains</b>	IEC connectors Plugs Power supply adaptors Cables Multiblocks Circuit breakers Anti-surge

### OPPORTUNITIES FOR CORE SKILL DEVELOPMENT

Candidates will be producing written and oral evidence as part of the assessment for Outcome 1. This offers ideal opportunities to develop aspects of the Core Skill of *Communication*.

Candidates will also have the opportunity to develop the Core Skill of *Problem Solving* while they are carrying out the task of connecting components, remedying faults and sound checking in Outcomes 2 and 3.

## National Unit Specification: support notes (cont)

### UNIT        Sound: Reinforcement (SCQF level 6)

#### GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

The following approaches to assessment are suggested:

Outcome 1:                project  
Outcomes 2 and 3:        practical exercise

For Outcome 1 Performance Criterion (d) it is recommended that candidates describe the signal flow by using a clear block diagram which identifies each of the components and illustrates the signal path within the system. This reflects industry standard.

In Outcome 2 candidates would be expected to resolve an incorrect connection, or to find a replacement for a malfunctioning component or cable. Resolving the fault within a component or cable would not be appropriate.

Outcome 3 should, ideally, be assessed in a controlled environment, ie not a public or other important event. Whilst it is of value to candidates to experience the added pressure of working in situations such as these, the potential for something to go wrong can be high. In this sense, it is recommended that live events take place in a context where the audience and others involved are sympathetic to the potential limited experience of the candidate.

In Outcome 3 the small-scale event could be real or simulated. Outcome 3 need not be assessed in front of an audience.

Time should be allowed for any necessary re-assessment.

#### Opportunities for the use of 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 communications technology (ICT), such as e-testing or the use of e-portfolios or e-checklists. Centres which wish to use e-assessment must ensure that the national standard is applied to all candidate evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. Further advice is available in *SQA Guidelines on Online Assessment for Further Education (AA1641, March 2003)*, *SQA Guidelines on e-assessment for Schools (BD2625, June 2005)*.

#### CANDIDATES WITH DISABILITIES AND/OR ADDITIONAL SUPPORT NEEDS

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering alternative Outcomes for Units. Further advice can be found in the SQA document *Guidance on Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs* ([www.sqa.org.uk](http://www.sqa.org.uk)).