

1. Module details**Module name****High Power Speaker Arrays and Cables****Module duration**

It is expected that students with the appropriate entry knowledge and skills will successfully complete this module in 18 - 20 hours.

Module code

NUE157

Discipline code

0703205 Electronic Engineering/Technologies.

2. Module purpose

This module will provide students with the knowledge and skills to install and maintain high power speaker arrays.

3. Prerequisites

NE98 Loudspeakers and Microphones.

4. Relationship to competency standards

This module provides part of the underpinning knowledge and skills in the 'Evidence Guide' of specific units of competency in the National Electrotechnology Training Package and provides similar support, where mapped, to equivalent units in the National Metals and Engineering Competency Standards. For details refer to the module to unit maps, available from NUEITAB.

5. Content**Speaker cables**

Types
Correct use
Installation
Maintenance

Connectors

Types
Characteristics
Correct termination
Fit-off

Speaker arrays

Types
Characteristics
Power rating
Applications
System phasing
Place and fix

Fault-finding techniques and repair

System functional requirements
Unit identification and replacement
Post service operational checks

6. Assessment strategy

Assessment methods

Assessment should be progressive reflecting a holistic approach to ensure the module purpose is met. To assist in ensuring validity, reliability and fairness assessment instruments should include practical exercises, assignments and written tests consisting of a number of item types, such as multiple choice, short answer and problem solving.

Conditions of assessment

Learning and assessment will take place in an environment that is conducive to a learner's development.

7. Learning outcome details

Learning outcome 1

Demonstrate the proper use, installation and maintenance of common types of speaker cables used in high-power audio systems.

Assessment criteria

- 1.1 List common types of cables used for loudspeaker connections.
- 1.2 Distinguish between domestic audio power amplifier equipment specifications and those for public address and concert applications.
- 1.3 Select appropriate cable types for loudspeaker connections given typical high-power audio installations.
- 1.4 State de-rating requirements applicable to selected cable types.
- 1.5 Describe the correct mounting hardware and techniques for surface and aerial cable runs applicable to selected cable types.
- 1.6 Describe approved and effective fault-finding, repair and jointing techniques.
- 1.7 Install and maintain a typical speaker cable installation to industry standards given the installation specifications.
- 1.8 Use approved workshop practices to repairs faulty cables.

Learning outcome 2

Identify typical connectors used in high-power audio systems and state typical capacities, uses and termination/fit-off requirements.

Assessment criteria

- 2.1 Identify typical connectors for high-power audio systems.
- 2.2 Given sample high-power audio connectors, state the connector electrical characteristics, typical use(s), correct termination and fit-off, and relevant cautions.
- 2.3 Given sample high-power audio connectors, use approved workshop practices to demonstrate correct termination and fit-off.

Learning outcome 3

Identify and describe the characteristics of speaker arrays commonly used in high-power audio systems, and recommend appropriate types for particular uses.

Assessment criteria

- 3.1 State the approximate audio power required for satisfactory sound levels given typical nominated sound reinforcement tasks.
- 3.2 Describe the type, number and power ratings of speaker arrays required given typical nominated sound reinforcement tasks.
- 3.3 Describe the techniques to ensure correct system phasing and methods to verify system phasing given nominated speaker arrays.
- 3.4 Determine the phasing status of the arrays and correct improper phasing given correctly and incorrectly-phased speaker arrays.
- 3.5 Describe the hardware and procedures required to effectively and safely place and fix the speaker arrays given nominated speaker arrays.

Learning outcome 4

Diagnose equipment and system faults and repair high power speaker array systems.

Assessment criteria

- 4.1 Perform a functional test of a high power speaker array system.
- 4.2 Identify, remove and replace faulty equipment, cables and connectors in a high power speaker array system.
- 4.3 Verify the post service operation of a high power speaker array system.

8. Delivery of the module

Delivery strategy

Delivery strategies must be suitable for learning both theoretical and practical aspects described in the module purpose. It is considered that the most effective method to achieve this is by integration of theory and practice where students learn by experimentation, research and reports. It is recommended that learning and assessment be facilitated in a holistic manner that may require learning outcome sequence other than that indicated in the module.

Notes. This module covers a variety of high-power audio systems. Trainers may not possess extensive high power audio equipment.

Live theatres, live music venues, and both classical and popular music concert venues use a wide variety of communications technologies and equipment. Audio engineering companies commonly respond to large venue audio needs.

Where suitable audio equipment is *not* available (or only a small inventory exists), trainers should consider the following.

- Visits to equipment manufacturers' and distributors' showrooms and to audio engineering companies.
- Visits to live theatres, live music venues, and both classical and popular music concert venues installations.
- Visits to service/installation workshops.

Resource requirements

Resources should be sufficient for students to carry out learning activities on an individual basis. This will require the following:

Suitable laboratory equipment: benches, lighting, adequate working space and ventilation, seating, hand soldering and IDC stations and equipment, heatshrink equipment.

Test equipment: cable and connector test equipment/sets, power supplies, connecting cables, multimeters, analog and digital signal generators, audio amplifiers, speaker arrays, load resistors, audio wattmeters.

Consumables: connectors, cables, cable ties and anchors, heatshrink tubing.

Equipment/service manuals or textbook descriptions of equipment, including faultfinding procedures.

Occupational health and safety requirements

A safe and healthy environment will be provided for students and teachers as well as the particular safety procedures followed as part of the learning / teaching activity and content.