

# CCSMT31

## Carry out advanced audio electronics repairs and maintenance of sound equipment



### Overview

This standard intends to further inform on basic electronics and demonstrate your knowledge of electronic theory and maintenance specific to sound engineering.

The standard is about the measurement and interconnection of audio equipment and the practical measurement techniques used in basic technical maintenance. You will need to construct basic electronic circuits and produce a report on construction, testing and measurement as evidence of understanding.

This standard demonstrates that you are able to identify common electrical problems in ways that can be reported coherently. It also demonstrates an awareness of the dangers of Voltages and current and audio electronics.

This standard utilises the knowledge and management expected of today's recording engineers, editing engineers, mastering engineers, mix engineers and programmers with a particular focus for Technical support and maintenance teams within larger organisations.

### **Good practice and operation:**

You will need advancing knowledge of audio electronics related to the music, sound, live sound, theatre and AV industries. You are expected to understand basic sources of energy and power with full safety considerations. You will analyse voltage, resistance, impedance, current, electronic equipment, electronic components, conductors and insulators and make basic measurements, again with full safety considerations.

This unit will not enable you individuals to be legally employed as service of electrical engineers. This standard is about carrying out basic problem solving or repairs. Please note to be fully certified as an electrician within the creative industries you should gain an appropriate qualification in Electro-technology. This can lead to qualified and certified employment within a host of industry servicing, repair and maintenance posts

The depth of these standards has also taken into consideration the current practice of buying off-the-shelf replacement parts/components and the general manufacturing trend that most professional sound equipment is now supplied with non serviceable parts/components, which are replaced rather than repaired.

Identification and location of faulty equipment, parts or components is an additional area that is useful to those who carrying out basic maintenance/repair skills.

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### Performance criteria

*You must be able to:*

- P1 prepare test bench area
- P2 remove equipment safely and label/memo
- P3 carry out relevant maintenance procedure/reporting
- P4 calculate solutions to equations relating to signal measurement and networks involving combinational passive components
- P5 measure audio signals
- P6 measure parameters relating to the specifications of audio equipment
- P7 construct a circuit and enclosure
- P8 select and identify correct components and verify
- P9 solder components to circuit board and verify
- P10 test parameters of circuit to verify
- P11 produce an assessment and test report of the circuit
- P12 seek appropriate help from others prior to use of unit
- P13 leave work area safe and tidy and reset after use

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### Knowledge and understanding

*You need to know and understand:*

- K1 how to calculate and measure audio signals
- K2 how to measure audio equipment parameters
- K3 the construction and measuring of audio circuits
- K4 ways of measuring the value of audio signals
- K5 how combinational passive components affect signal voltages across different frequencies
- K6 specification parameters used
- K7 procedures used to measure specification parameters
- K8 professional standards for audio equipment specifications
- K9 the relevant electronic components
- K10 circuit board soldering techniques
- K11 how to evaluate performance of a circuit and components
- K12 how and when to seek support or assistance

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Developed by	Creative & Cultural Skills
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Version number	1
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Date approved	April 2012
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Validity	Current
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Status	Original
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Originating organisation	Creative & Cultural Skills
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Original URN	CCSMT31
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Relevant occupations	Maintenance engineers; technical support; Live sound Engineers; artists; Recording Engineers; recording Producers; mix engineers; assistant engineers; programmers; Mastering Engineers; editing engineers; OB/post engineers; writers; co writers; tape ops; Studio managers; facility managers; acoustic designers; acoustic building designers;
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Suite	Music Technology; Live Events
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Key words	Soldering iron wattage; solder bridges; dry joints; heat sink, component/solder removal; Capacitive reactance; inductive reactance; total impedance; transformer voltage ratio; current ratio; impedance ratio; crossover frequency; minus 3 dB point; Resistance; capacitance; capacitive reactance; inductance; inductive reactance; impedance; series and parallel networks; transformer; dB per octave; crossover frequency; AC voltage; AC Power; crest value; voltmeter; oscilloscope; Vu meter; peak programme meter (PPM); dummy load; output power; quiescent current; Breadboard/stripboard component layout; input/output sockets; power switch; battery enclosure; Active DI box; Voltage gain; frequency response, bandwidth; total harmonic distortion; inter-modulation distortion; signal to noise ratio; equivalent input noise; dynamic range; headroom; output power; quiescent current; inter-modulation; output power; dynamic range; input impedance; output impedance; Parameter measurements; circuit board layout; construction report; circuit schematic;
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music; sound; music technology; Live Events, Exhibitions;