# CCSMT30
# Carry out basic repairs and maintenance of sound equipment

## Overview

This standard is about basic electronics as the quality of all analogue electrical signals is influenced by the components through which they pass. In the digital-domain, electronics influences the reliability and speed of digital algorithm operations. Surface mount technologies are leading to the redundancy of some servicing and repair operations which require more hands on replacement of 'off the shelf parts'. However, an appreciation of electrical circuit design and construction will help you appreciate the transformations involved in the analogue audio signal path and there are still many small repairs and adjustments which may be carried out by a semi-skilled operator in the field. An appreciation of electrical quantities and related equations can help the modern audio engineer to preserve proper signal characteristics and to achieve good matching between different types of equipment.

This standard does not qualify you to repair or service electronic equipment as a career but is about a detailed overview of specific areas associated with electrical and electronic technologies within the music, sound and audio visual industries.

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.

You will demonstrate the basics 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 standards will not enable you to be legally employed as service of electrical engineers. This standard is about demonstrating an overview for those that seek to further understand the design and technology behind equipment used during practical tasks within the music and sound industries to carry out basic problem solving or repairs. Please note to be fully certified as an electrician within the creative industries you should study an appropriate qualification. 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 with basic maintenance/repair skills.

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## Performance criteria

*You must be able to:*

P1 carry out correct mains electrical power wiring of a 13 amp plug and socket
P2 make basic calculations of energy and power
P3 locate equipment labels and identify values for mains voltage and frequency
P4 carry out calculations for voltage, resistance, impedance and current
P5 produce diagrams of series and parallel resistance
P6 measure materials to discover their conducting or insulating properties
P7 set up and use of basic test equipment to measure resistance
P8 conduct basic tests of electrical components
P9 distinguish replacement components of different values
P10 assess the electrical characteristics of electronic components
P11 produce electronic symbols on circuit block diagrams
P12 produce simple circuit diagrams
P13 conduct a series of electrical measurements
P14 operate pieces of electrical measuring equipment
P15 create reports of measurement data
P16 test for and locate faulty components
P17 tidy all areas and make safe on completion of work

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## Knowledge and understanding

*You need to know and understand:*

K1 sources of energy and power
K2 voltage, current, resistance and impedance
K3 conductors and insulators
K4 different types of electrical measurements
K5 sources of electrical power
K6 types of energy and power
K7 parameters relating to mains electrical power
K8 mains voltage requirements of different countries
K9 the relationship of voltage, resistance and impedance and their effects on current
K10 the process for measuring resistance
K11 different constructional components of electrical equipment
K12 types of electronic components
K13 how various measurements and data are recorded
K14 the features and uses of electrical measuring equipment

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| **Developed by** | Creative & Cultural Skills |
| **Version number** | 1 |
| **Date approved** | April 2012 |
| **Indicative review date** | April 2016 |
| **Validity** | Current |
| **Status** | Original |
| **Originating organisation** | Creative & Cultural Skills |
| **Original URN** | CCSMT30 |
| **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; |
| **Suite** | Music Technology; Live Events |
| **Key words** | Direct voltage, direct current (DC); alternating current (AC); ;electrical power; resistance; frequency; DC and AC; sine wave;, circuit/fuse/cable continuity test; current level; calibration; amplification; Ammeter; ohmmeter; voltmeter; multi-meter; oscilloscope; ac measurements; LCR/ impedance meters; analogue dBm meters; frequency meters; power meters; range selector switches; VU meter; PPM meter;, Electrical measuring equipment; power meters, circuit testers, fault finding, identification of fault, location of fault; fault reporting;, Valves; potentiometers (rotary and fader); resistors; capacitors; inductors; transformers; diodes; transistors; integrated circuits (analogue/digital); microprocessors; smoothing capacitors; microcontrollers; EMI/RFI suppressors; Electronic symbols and abbreviations;, general diode; ground/earth chassis; fuses; variable attenuator; battery; cell; circuit breaker; phone coaxial input; jack input; stereo headphone input; microphone input; potentiometer; speaker; shielding; relay;, resonator; signal lamp, faders; |

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Passive crossover; mains power supply; music; sound; music technology; Live Events, Exhibitions;