



# MUSIC PRODUCTION-I

## CLASS - XI



**CENTRAL BOARD OF SECONDARY EDUCATION**

2, Community Centre, Preet Vihar, Delhi-110092

## MUSIC PRODUCTION - I

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## भारत का संविधान

### उद्देशिका

हम, भारत के लोग, भारत को एक सम्पूर्ण 'प्रभुत्व-संपन्न समाजवादी पंथनिरपेक्ष लोकतन्त्रात्मक गणराज्य बनाने के लिए, तथा उसके समस्त नागरिकों को:

सामाजिक, आर्थिक और राजनैतिक न्याय,  
विचार, अभिव्यक्ति, विश्वास, धर्म  
और उपासना की स्वतंत्रता,  
प्रतिष्ठा और अवसर की समता  
प्राप्त कराने के लिए  
तथा उन सब में व्यक्ति की गरिमा

<sup>2</sup>और राष्ट्र की एकता और अखंडता  
सुनिश्चित करने वाली बंधुता बढ़ाने के लिए

दृढसंकल्प होकर अपनी इस संविधान सभा में आज तारीख 26 नवम्बर, 1949 ई० को एतद्वारा इस संविधान को अंगीकृत, अधिनियमित और आत्मार्पित करते हैं।

1. संविधान ( बयलीसवां संशोधन ) अधिनियम, 1976 की धारा 2 द्वारा ( 3.1.1977 ) से "प्रभुत्व-संपन्न लोकतन्त्रात्मक गणराज्य" के स्थान पर प्रतिस्थापित।
2. संविधान ( बयलीसवां संशोधन ) अधिनियम, 1976 की धारा 2 द्वारा ( 3.1.1977 ) से "राष्ट्र की एकता" के स्थान पर प्रतिस्थापित।

### भाग 4 क

### मूल कर्तव्य

**51 क. मूल कर्तव्य** – भारत के प्रत्येक नागरिक का यह कर्तव्य होगा कि वह –

- (क) संविधान का पालन करे और उसके आदर्शों, संस्थाओं, राष्ट्रध्वज और राष्ट्रगान का आदर करे;
- (ख) स्वतंत्रता के लिए हमारे राष्ट्रीय आंदोलन को प्रेरित करने वाले उच्च आदर्शों को हृदय में संजोए रखे और उनका पालन करे;
- (ग) भारत की प्रभुता, एकता और अखंडता की रक्षा करे और उसे अक्षुण्ण रखे;
- (घ) देश की रक्षा करे और आह्वान किए जाने पर राष्ट्र की सेवा करे;
- (ङ) भारत के सभी लोगों में समरसता और समान भ्रातृत्व की भावना का निर्माण करे जो धर्म, भाषा और प्रदेश या वर्ग पर आधारित सभी भेदभाव से परे हों, ऐसी प्रथाओं का त्याग करे जो स्त्रियों के सम्मान के विरुद्ध हैं;
- (च) हमारी सामासिक संस्कृति की गौरवशाली परंपरा का महत्त्व समझे और उसका परिरक्षण करे;
- (छ) प्राकृतिक पर्यावरण की जिसके अंतर्गत वन, झील, नदी, और वन्य जीव हैं, रक्षा करे और उसका संवर्धन करे तथा प्राणिमात्र के प्रति दयाभाव रखे;
- (ज) वैज्ञानिक दृष्टिकोण, मानववाद और ज्ञानार्जन तथा सुधार की भावना का विकास करे;
- (झ) सार्वजनिक संपत्ति को सुरक्षित रखे और हिंसा से दूर रहे;
- (ञ) व्यक्तिगत और सामूहिक गतिविधियों के सभी क्षेत्रों में उत्कर्ष की ओर बढ़ने का सतत प्रयास करे जिससे राष्ट्र निरंतर बढ़ते हुए प्रयत्न और उपलब्धि की नई उंचाइयों को छू ले;
- <sup>1</sup>(ट) यदि माता-पिता या संरक्षक हैं, छह वर्ष से चौदह वर्ष तक की आयु वाले अपने, यथास्थिति, बालक या प्रतिपाल्य के लिये शिक्षा के अवसर प्रदान करे।

1. संविधान ( छयासीवां संशोधन ) अधिनियम, 2002 द्वारा प्रतिस्थापित।



## THE CONSTITUTION OF INDIA

### PREAMBLE

**WE, THE PEOPLE OF INDIA**, having solemnly resolved to constitute India into a <sup>1</sup>**SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC** and to secure to all its citizens :

**JUSTICE**, social, economic and political;

**LIBERTY** of thought, expression, belief, faith and worship;

**EQUALITY** of status and of opportunity; and to promote among them all

**FRATERNITY** assuring the dignity of the individual and the<sup>2</sup> unity and integrity of the Nation;

**IN OUR CONSTITUENT ASSEMBLY** this twenty-sixth day of November, 1949, do **HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.**

1. Subs, by the Constitution (Forty-Second Amendment) Act. 1976, sec. 2, for "Sovereign Democratic Republic" (w.e.f. 3.1.1977)
2. Subs, by the Constitution (Forty-Second Amendment) Act. 1976, sec. 2, for "unity of the Nation" (w.e.f. 3.1.1977)

## THE CONSTITUTION OF INDIA

### Chapter IV A

### FUNDAMENTAL DUTIES

#### ARTICLE 51A

**Fundamental Duties** - It shall be the duty of every citizen of India-

- (a) to abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;
- (b) to cherish and follow the noble ideals which inspired our national struggle for freedom;
- (c) to uphold and protect the sovereignty, unity and integrity of India;
- (d) to defend the country and render national service when called upon to do so;
- (e) to promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities; to renounce practices derogatory to the dignity of women;
- (f) to value and preserve the rich heritage of our composite culture;
- (g) to protect and improve the natural environment including forests, lakes, rivers, wild life and to have compassion for living creatures;
- (h) to develop the scientific temper, humanism and the spirit of inquiry and reform;
- (i) to safeguard public property and to abjure violence;
- (j) to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement;
- <sup>1</sup>(k) to provide opportunities for education to his/her child or, as the case may be, ward between age of 6 and 14 years.

1. Subs, by the Constitution (Eighty-Sixth Amendment) Act. 2002.

# PREFACE

Music has a fine quality of capturing peoples mind and soul. This qualifications in music will see the students enjoying a range of high quality learning resources such as the live performance venue, fully equipped recording studios, rehearsal studios, and fully equipped labs designed for music production and a music management office.

Throughout the studies there is a strong focus on performance and song writing, you will also gain knowledge of how the music industry works, how to develop and promote yourself as an artist/performer and gain insights into the management of your creative work. Units studied will cover writing/composition, performance skills, musical knowledge and concepts, music analysis, technical skill development and self-management.

The ultimate goal of this book is to provide students with a strong foundation of musical skills, knowledge, and discipline, which can be applied throughout their lives. Such a foundation allows many students to remain actively involved in the study of music, and provides experiences that open avenues for personal and group expression.

As students participate in organized musical activities, they learn cooperation and an awareness of their role in community and society. This awareness can lead students to appreciate, not only their own culture, but also other cultures from around the world.

By defining the purpose and direction of the senior secondary music curriculum, it is hoped that both the school and community will unite in valuing the goals and outcomes in music education for all students.

CBSE takes this opportunity and thank all the contributors, authors and the dedicated team of people from Central Institute of Technology, Australia who have helped in preparation of this book.

The Board is grateful to the members of the Committee of Course for their advice, guidance and total commitment towards development of this course. We are indeed indebted to these academic advisors who have lent us the benefit of their rich and insightful experience. I would like to appreciate Vocational Education Cell, CBSE; for coordinating and successfully completing the work.

**Vineet Joshi, IAS**  
Chairman

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## SECTION - III

### LEARNING PLAN Learning Plan -Cluster

Cluster Title	Performance specialities
Code and Unit Title	BSBWOR203A-Work effectively with others CUSMLT202A-Apply knowledge of music culture to music making CUSMPF201A-Play or sing simple musical piece
Resources	Class Notes Music Culture Video Before the Music Dies (not provided)
Elements	<p><b>Working effectively with others</b></p> <ol style="list-style-type: none"> <li>1. Develop effective workplace relationships</li> <li>2. Contribute to workgroup activities</li> <li>3. Deal effectively with issues, problems and conflict</li> </ol> <p><b>Apply knowledge of music culture to music making</b></p> <ol style="list-style-type: none"> <li>1. Apply information on the contexts of musical styles</li> <li>2. Maintain currency of own knowledge of music culture in Australian society.</li> <li>3. Update and maintain information sources</li> </ol> <p><b>Play or sing simple musical pieces-</b></p> <ol style="list-style-type: none"> <li>1. Explore the range and capability of chosen instrument or voice.</li> <li>2. Maintain and care for instrument</li> <li>3. Use personal practice time to develop skills</li> <li>4. Perform short pieces</li> </ol> <p><b>Work effectively with others-</b></p> <p>Evidence of the following is essential</p> <ul style="list-style-type: none"> <li>* providing support to team members to ensure goals are met.</li> <li>* seeking feedback from clients and /or colleagues and taking approximate.</li> <li>* knowledge of appropriate conflict resolution techniques</li> </ul>
Critical aspects evidence	<p><b>Apply knowledge of music culture to music making</b></p> <p><b>Evidence of the ability to</b></p> <ul style="list-style-type: none"> <li>* source information on musical styles and culture</li> <li>* apply information to day to day work activities including own music making</li> <li>* check credibility and reliability of information</li> <li>* maintain currency of information</li> </ul>

	<p><b>Play or sing simple musical pieces</b> <b>Evidence of the ability to</b></p> <ul style="list-style-type: none"><li>* demonstrate the physical capacity and coordination required to play or sing simple pieces</li><li>* respond appropriately to constructive feedback on own performance.</li></ul>
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**BSBWOR203A**

**[Work effectively with other]**

## BSBWOR203A - Work Effectively With Others

### Unit descriptor

This unit describes the performance outcomes, skills and knowledge required to work in a group environment promoting team commitment and cooperation, supporting team members and dealing effectively with issues, problems and conflict.

### Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Develop effective workplace relationships	<ul style="list-style-type: none"><li>1.1. Identify own <b>responsibilities and duties</b> in relation to <b>workgroup members</b> and undertake activities in a manner that promotes cooperation and good relationships</li><li>1.2. Take time and resource constraints into account in fulfilling work requirements of self and others</li><li>1.3. Encourage, acknowledge and act upon constructive <b>feedback</b> provided by others in the workgroup</li></ul>
2. Contribute to workgroup activities	<ul style="list-style-type: none"><li>2.1. Provide <b>support to team members</b> to ensure workgroup goals are met</li><li>2.2. Contribute constructively to workgroup goals and tasks according to organisational requirements</li><li>2.3. Share <b>information</b> relevant to work with workgroup to ensure designated goals are met</li><li>2.4. Identify and plan <b>strategies/opportunities for improvement</b> of workgroup in liaison with workgroup</li></ul>



<p>3. Deal effectively with issues, problems and conflict</p>	<p>3.1. Respect differences in personal values and beliefs and their importance in the development of relationships</p> <p>3.2. Identify any linguistic and cultural differences in communication styles and respond appropriately</p> <p>3.3. Identify issues, problems and conflict encountered in the workplace</p> <p>3.4. Seek assistance from workgroup members when issues, problems and conflict arise and suggest possible ways of dealing with them as appropriate or refer them to the appropriate person</p>
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## REQUIRED SKILLS AND KNOWLEDGE








This section describes the skills and knowledge required for this unit.

### Required skills

- Literacy skills to read and understand the organisation's policies and work procedures, to write simple instructions for particular routine tasks and to interpret information gained from correspondence
- communication skills to request advice, to receive feedback and to work with a team.
- Technology skills to select and use technology appropriate to a task
- Culturally appropriate communication skills to relate to people from diverse backgrounds and people with diverse abilities.

### Required knowledge

Key provisions of relevant legislation from all levels of government that may affect aspects of business operations, such as:

-  Anti-discrimination legislation
-  Ethical principles
-  Codes of practice
-  Privacy laws
-  Occupational health and safety (OHS)
-  Organisational policies, plans and procedures
-  Workgroup member responsibilities and duties, and relationship to individual responsibilities and duties.

<b>RANGE STATEMENT</b>	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
<p><b>Responsibilities and duties</b> may include:</p>	<ul style="list-style-type: none"> <li>• Code of Conduct</li> <li>• Job description and employment arrangements organisation's policy relevant to work role</li> <li>• Skills, training and competencies</li> <li>• Supervision and accountability requirements including OHS team structures</li> </ul>
<p><b>Workgroup members</b> may include:</p>	<ul style="list-style-type: none"> <li>• Coach/mentor</li> <li>• Other members of the organisation</li> <li>• Peers/work colleagues/team/enterprise</li> <li>• Supervisor or manager</li> </ul>
<p><b>Feedback</b> on performance may include:</p>	<ul style="list-style-type: none"> <li>• Formal/informal performance appraisals</li> <li>• Obtaining feedback from clients</li> <li>• Obtaining feedback from supervisors and colleagues</li> <li>• Personal, reflective behaviour strategies</li> <li>• Routine organisational methods for monitoring service delivery</li> </ul>
<p><b>Support to team members</b> may include:</p>	<ul style="list-style-type: none"> <li>• Explaining/clarifying</li> <li>• Helping colleagues</li> <li>• Problem-solving</li> <li>• Providing encouragement</li> <li>• Providing feedback to a team member</li> <li>• Undertaking extra tasks if necessary</li> </ul>
<p><b>Information</b> to be shared may include:</p>	<ul style="list-style-type: none"> <li>• Acknowledging satisfactory performance</li> <li>• Acknowledging unsatisfactory performance</li> <li>• Assisting a colleague</li> <li>• Clarifying the organisation's preferred task</li> <li>• Completion methods</li> <li>• Encouraging colleagues</li> <li>• Open communication channels</li> <li>• Workplace hazards, risks and controls</li> </ul>

RANGE STATEMENT	
<p><b><i>Strategies/opportunities for improvement</i></b> may include:</p>	<ul style="list-style-type: none"> <li>• Career planning/development</li> <li>• Coaching, mentoring and/or supervision</li> <li>• Formal/informal learning programs</li> <li>• Internal/external training provision</li> <li>• Performance appraisals</li> <li>• Personal study</li> <li>• Recognition of current competence</li> <li>• (RCC)/skills recognition/initial Assessment</li> <li>• Work experience/exchange/opportunities</li> <li>• Workplace skills assessment</li> </ul>

**CUSMLT202A**

**Apply Knowledge of Music Culture to Music Making**

## CUSMLT202A Apply knowledge of music culture to music making

### Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to explore aspects of music culture in Australian society and apply the information obtained to own music making.






### Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Apply information on the contexts of musical styles	<p>1.1 Seek information on the <b>context</b> of one or more <b>musical styles</b> using appropriate <b>information sources</b></p> <p>1.2 Identify positive <b>values</b> in one or more musical styles using appropriate information sources</p> <p>1.3 Check the credibility and reliability of information sources with <b>appropriate people</b></p> <p>1.4 Comply with copyright and cultural requirements when accessing information</p> <p>1.5 Apply information on musical styles to own music making</p>
2. Maintain currency of own knowledge of music culture in Australian society.	<p>2.1 Identify the repertoire of one or more musical styles in Australian society</p> <p>2.2 Seek information on the use of <b>technology</b> in one or more musical styles in Australian society</p> <p>2.3 Identify the <b>challenges</b> faced by musicians working in one or more musical styles in Australian society</p> <p>2.4 Seek information on the way in which one or more musical styles is/are portrayed in the media</p> <p>2.5 Seek information on further training and educational opportunities in one or more musical styles in Australian society</p>
3. Update and maintain information sources	<p>3.1 Update information sources on a regular basis</p> <p>3.2 Monitor changes in the use of technology</p> <p>3.3 Store information in an easily accessible format</p> <p>3.4 Share information with colleagues and peers</p> <p>3.5 Apply information on music culture to own music making</p>






## Required Skills and Knowledge

*This section describes the skills and knowledge required for this unit. Required*

### Skills

-  Communication skills sufficient to share information with colleagues and peers.
-  Research skills sufficient to locate and use relevant sources of information
-  Literacy skills sufficient to read and understand relevant sources of information
-  Planning and organisational skills sufficient to update, maintain and store information
-  Technology skills sufficient to access and download information from the internet

### Required knowledge

-  Basic understanding of:
-  Relationships between composers, performers, producers, recording artists, Songwriters, recording engineers, critics and audiences
-  Social, cultural, historical and economic significance of a selected musical Style in Australian society
-  Technology used for producing and enhancing music in a selected musical Style in Australian society
-  Ways in which music is part of the culture of Australian society

### RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

**Context** may include:

- Cultural significance
- Economic significance
- Historical significance
- Social significance.

<b>Musical styles</b> may include:	<ul style="list-style-type: none"> <li>• Classical/concert</li> <li>• Contemporary/art</li> <li>• Ethnic/traditional</li> <li>• Folk</li> <li>• Indigenous</li> <li>• Jazz</li> <li>• Popular/commercial</li> <li>• Rock</li> <li>• World.</li> </ul>
<b>Information sources</b> may include:	<ul style="list-style-type: none"> <li>• Archives</li> <li>• Community organisations</li> <li>• Discussions with current industry practitioners</li> <li>• Government departments</li> <li>• Industry associations and organisations</li> <li>• Industry journals</li> <li>• Internet</li> <li>• Libraries</li> <li>• Media archives</li> <li>• Print and electronic media</li> <li>• Museums and galleries</li> <li>• Organisational policies and procedures</li> <li>• Personal observations and experience</li> <li>• Professional organisations</li> <li>• Reference books</li> <li>• Technical publications and manuals.</li> </ul>
<b>Values</b> may include :	<ul style="list-style-type: none"> <li>• Communicating cultural heritage and social change</li> <li>• Encouraging and engaging creative thought and action.</li> <li>• Enhancing physical and mental states</li> <li>• Enhancing relaxation and leisure time</li> <li>• Improving concentration</li> <li>• Arousing patriotism and nostalgia.</li> </ul>
<b>Appropriate people</b> may include	<ul style="list-style-type: none"> <li>• Agents, artists' managers and industry managers</li> <li>• Content experts</li> <li>• Copyright representatives</li> <li>• Current industry practitioners</li> <li>• Employee association and union representatives</li> </ul>

	<ul style="list-style-type: none"> <li>• Industry and industry association representatives</li> <li>• Information professionals, e.g. libraries and museums.</li> <li>• Legal representatives.</li> </ul>
<b>Technology</b> may include	<ul style="list-style-type: none"> <li>• Camera and projection equipment</li> <li>• Computer technology</li> <li>• Music production software and hardware</li> <li>• Musical equipment and instruments</li> <li>• Sound-editing software and hardware</li> <li>• Sound-recording software and hardware</li> <li>• Sound reinforcement equipment, such as: <ul style="list-style-type: none"> <li>• Microphones</li> <li>• Amplifiers</li> <li>• Speakers</li> <li>• Mixers</li> <li>• Consoles</li> <li>• Cabling</li> </ul> </li> <li>• Sound transmission and the internet</li> <li>• Video editing software and hardware.</li> </ul>
<b>Challenges</b> may include	<ul style="list-style-type: none"> <li>• Audience perceptions and expectations</li> <li>• Changing nature of the marketplace, including</li> <li>• Marketing and production of Products and services</li> <li>• Communicating with industry practitioners</li> <li>• Feasibility and success in commercial markets</li> <li>• Impact of the media: <ul style="list-style-type: none"> <li>• Perceptions and expectations of music journalists.</li> <li>• Positive and negative bias in media reports</li> <li>• Shaping and reflecting contemporary culture</li> <li>• Treatment of cultural values in media reports.</li> </ul> </li> </ul>



**CUSMPF201A**

**[Play or Sing Simple Musical Pieces]**

## CUSMPF201A Play or sing simple musical pieces

### Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to prepare for and perform a simple musical sequence or piece.

### Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Explore the range and capability of chosen instrument or voice	<ul style="list-style-type: none"><li>1.1 Explore the physical characteristics of <b>instrument</b> or voice in music making</li><li>1.2 Explore the <b>scope, capability</b> and sound characteristics of instrument or voice in music making</li><li>1.3 Explore a range of ways in which sound can be produced in line with selected musical style and <b>repertoire</b></li></ul>
2. Maintain and care for instrument	<ul style="list-style-type: none"><li>2.1 Use appropriate methods and cleaning products to care for, move, use and store instrument and <b>accessories</b></li><li>2.2 Set up and/or warm up instrument or voice in preparation for practice and performance.</li><li>2.3 <b>Tune</b> instrument appropriately and seek feedback from <b>relevant personnel</b> to confirm accuracy of tuning</li></ul>
3. Use personal practice time to develop skills	<ul style="list-style-type: none"><li>3.1 Listen to own work carefully to develop intonation, harmonies and/or rhythm, and seek feedback from relevant personnel to guide practice</li><li>3.2 Use personal practice to develop physical <b>facility</b> and confidence with instrument or voice</li><li>3.3 Use good posture and appropriate finger, hand and/or body positions to develop technical facility and maintain healthy performance habits</li><li>3.4 Develop listening skills to recognise and identify pitch, rhythm, instrumentation and musical style</li></ul>

4. Perform short pieces	<p>4.1 Guided by a teacher or mentor, plan activities and physical <b>exercises</b> to expand capacity to perform a range of short, simple pieces and a range of notes, rhythms and/or chord patterns</p> <p>4.2 Listen to the work of professional musicians to identify own goals and evaluate own work against those goals.</p> <p>4.3 Play or sing short, simple pieces and/or accompaniments using rhythmic control and tuning</p> <p>4.4 Perform all work following agreed tempi</p> <p>4.5 Apply listening skills in playing or singing short, simple pieces or accompaniments</p> <p>4.6 Comply with <b>OHS principles</b> in practice sessions and performances</p>
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## Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

### Required skills

Communication, teamwork and organisational skills sufficient to:

- ✎ Interpret music at a basic level for performance practice
- ✎ Respond appropriately to constructive feedback on own performance
- ✎ Plan own practice time and set skill-development goals
- ✎ Listening skills sufficient to:
  - ✎ Monitor and adjust intonation as required
  - ✎ Use appropriate sound and tone production for instrument or voice
- ✎ Reproduce basic musical patterns
- ✎ Learning skills in the context of:
  - ✎ Using printed or audio tutoring resources
  - ✎ Improving skills through practice
- ✎ Technical and problem-solving skills sufficient to:
  - ✎ Use a basic range of techniques on chosen instrument
  - ✎ Tune instrument to achieve intonation
  - ✎ Discriminate pitch and produce the required sound
  - ✎ Discriminate rhythm
  - ✎ Reproduce musical patterns

## Required knowledge

Basic understanding of:

- Repertoire relevant to selected instrument or voice
- Musical terminology
- Acoustic principles relevant to selected instrument or voice
- Instrument parts, applications, range, capabilities, care and maintenance
- Performance and instrumental protocol and customs in selected musical style and repertoire
- OHS practices, procedures and standards as they apply to performance practice

Range Statement	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
<b><i>Instruments</i></b> may include	Acoustic or electronic Voice Stringed Keyboards Wind Percussion Brass Plucked.
<b><i>Scope</i></b> of an instrument may include Tone colour:	Instrumental attack Range of accessories Interaction between player and instrument Performer's physique Voice production Sound production Effects Dynamics and volume Pitch, register and tessitura Specific effects available using a range of attacks.

<b>Capability</b> of an instrument may include its:	Application to a range of music-making activities and outcomes Scope and potential for solo or group performance. Adaptability, Size.
<b>Repertoire</b> may include	Short, simple pieces appropriate to the selected instrument Song forms and their relevant components, such as: Riffs Sequences Rhythm patterns Pieces composed for or by the performer.
<b>Accessories</b> may include	Reeds Strings Plectrums Mouth pieces Sticks, mallets, brushes and beaters Stands Pedals Microphones Amplifiers Samplers Mixers Enhancers, such as pitch and tone modulators.
<b>Tuning</b> an instrument may involve	Adjusting: Pitch Tone colour Oral tract, including lip pressure and intensity of breath Position of the diaphragm and larynx Sound production Diameter or other instrumental dimensions, such as: Length of strings Tautness of skins Length of tubing or pipes Embouchure Settings of the instrument and relevant accessories using: Appropriate tuning options

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## NOTES AND ASSESSMENT

### Overview:

Music Culture - What is it? Exploring the terms in greater depth and linking them together

### Lecture:

Use interactivity giving the students the opportunity to contribute their ideas on the subject as much as possible.

The extract on the following pages gives a general overview of the music culture.

### What is Music?

Music is an art form whose essence is sound. Common elements of music are pitch (which governs melody and harmony), rhythm (and its associated concepts tempo, meter and articulation), dynamics, and the sonic qualities of timbre and texture.

### What is culture?

Culture is an integral part of every society. It is a learned pattern of behavior and ways in which a person lives his or her life.

Culture is essential for the existence of a society, because it binds people together.

Culture constitutes the music, food, arts and literature of a society.

Every society has a distinct culture that forms the backbone of the society.

Culture does not remain stagnant, on the other hand it is evolving constantly and is in fact somewhat influenced by the other cultures and societies.

Every society has a different culture, where people share a specific language, traditions, behavior, perceptions and beliefs.

Culture gives them an identity which makes them unique and different from people of other cultures.

It is not only a means of communication between people, but also creates a feeling of belonging and togetherness among people in the society.

A culture's music is influenced by all other aspects of that culture, including social and economic organization and experience, climate, and access to technology. The emotions and ideas that music expresses, the situations in which music is played and listened to, and the attitudes towards music players and composers all vary between regions and periods.

Music is found in every known culture, past and present, varying widely between times and places.

All people of the world, including the most isolated tribal groups, have a form of music.

Music may have been in existence for at least 50000 years and the first music may have been invented in Africa and then evolved to become a fundamental constituent of human life. The origin of music likely stems from naturally occurring sounds and rhythms. Human music may echo themes of phenomena using patterns, repetitions and tonality.

Some cultures have certain instances of their music intending to imitate natural sounds. Aboriginals.

OR inate fifi

It is probable that the first musician instrument was the human voice itself, which can make a vast array of sounds, from singing, humming and whistling through clicking, coughing and yawning.

What did ancient music reflect of the culture of that time? Folk stories in some cultures a political voice. Classical music—reflected the culture of the upper classes of that time.



### Modern Music

#### A cultural voice for minorities -examplesfi

Teenagers (1950s coinage) : rise of a new financial independence and a new musical language, rock'n'roll. In Britain, pop music remained for a long time part of a mass market that was not specifically associated with alienated youth. The beetles, for example, had an audience of all ages, and their songs quickly passed into the light music market as melodies. The first clear sign that pop music had become a subculture was The Who's My Generation in 1965. Subcultures are characterised by a total lifestyle, often involving parody of the dominant culture-

1. the 'mods' parodied the trappings of the upwardly mobile.
2. skinheads parody the model worker, rejecting one of the major postwar myths-that Britain is a classless, contented society where everyone has a place.
3. reggae, still the dominant music of poor blacks, turns the sordid realities of poverty and exile into what Jean Genet called 'signs of grandeur'. Black aspirations to be assimilated into a new middle class were rejected in favour of dreadlocks, tams (knitted woolly hats) and ganja (marijuana)
4. Punk undermined the idea of the lone creative artist. Rather than setting up an alternative philosophy like reggae, punk confronted the whole value system of the dominant culture. Dress and body decoration were parodic of conventional style, often using materials recovered from the waste systems of modern society. Finally, the spiky hair and safty pins mimicked the extremes of display and disfigurement entailed in the pursuite of high fashion.
5. "ethnic" music - the sounds of a usually exotic and supposedly isolated culture.
6. Techno has all the features of a subculture, in language (obscenity, codenames etc), dress (baggy trousers, peaked caps, basketball shoes) and resistance to the status quo (raves, E-taking etc.).
7. women singers such as Chrissy Hinde and Sinead O'Connor are more in control of their images, and therefore, of their lives, than other female icons.

The 20th Century saw a revolution in music listening as the radio gained popularity worldwide and new media and technologies were developed to record, capture, reproduce and distribute music. Music performance became increasingly visual with broadcast and recording of music videos and concerts. Music of all kinds also became increasingly portable. Headphone allowed people sitting next to each other to listen to entirely difference performances or share the same performance. 20th Century music brought a new freedom an wide experimentation with new musical styles and forms that challenged the accepted rules of music of earlier periods. The invention of musical amplification and electronic instruments, especially the synthesizer, in the mid -20th century revolutionized popular music and accelerated the development of new forms of music.

Reflection of our consumerist culture!

## Session 3

### Overview:

Examining music cultures around the world.

### Lecture :

Use world map to brainstorm students' understanding of the cultural history of broad continental regions and how this culture has been either shaped by or is reflected in, the music of that region.



Refer to notes on American and British music to explore these two in greater depth.

Links:[http://en.wikipedia.org/wiki/Music\\_of\\_the\\_United\\_States](http://en.wikipedia.org/wiki/Music_of_the_United_States)

[http://en.wikipedia.org/wiki/Music\\_of\\_the\\_United\\_Kingdom](http://en.wikipedia.org/wiki/Music_of_the_United_Kingdom)

### Session 4

#### Overview:

Examining Australia's music culture.

#### Lecture:

Refer to notes.

Performance week.

### Session 5

#### Overview:

The future of the music industry.

**Activity:** Watch the video “Before the Music Dies”.

Group discussion as to what the students' views are on the issues raised.

## Assessment : Worksheet: Music Culture

Elements tested: CUSSMLT202A: 1 to 3

### Questions:

1. Apart from music, what are 3 other aspects of a society's culture?  
\_\_\_\_\_  
\_\_\_\_\_
2. List 4 characteristics that define music:  
\_\_\_\_\_  
\_\_\_\_\_
3. What were 3 areas of the world that influenced early American music?  
\_\_\_\_\_  
\_\_\_\_\_
4. Which decade in the 1900's did blues become part of American popular music?  
\_\_\_\_\_  
\_\_\_\_\_
5. What other styles of music influences contributed to American country music?  
\_\_\_\_\_  
\_\_\_\_\_
6. Name 1 famous American punk band of the 1970's:  
\_\_\_\_\_  
\_\_\_\_\_

7. Describe what you understand by the term British Invasion:

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8. What world event led to the influx of American music into Britain in the 1940's:

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9. Which American band did the Beatles use as a band name influence?

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10. Which Australian performer of the 1950's was known as the Wild One?

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11. Who is the lead singer of Cold Chisel?

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12. Name the Northern Territory band of the 1980's and 1990's that brought Indigenous Australian music into mainstream popular music?

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Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

Lecturer: \_\_\_\_\_ Date: \_\_\_\_\_

## Session 6

### Overview:

Examining musical instruments: The Human Voice

### Lecture:

Refer to notes.

Links: [http://en.wikipedia.org/wiki/Human\\_voice](http://en.wikipedia.org/wiki/Human_voice)

## Session 7

### Overview:

Examining musical instruments: The Guitar.

**Activity:** Students are to brainstorm all the types of guitars they can think of.  
Refer to checklist.

### Lecture:

History of the Guitar - Refer to notes.

Return to checklist and expand on features of each type refer to notes on following page.

Demonstrate examples.

### Types of Guitar

Demonstrate all the types of guitars available from stores and show differences and peculiarities:

#### **Flat neck**

**Classical**    nylon string

**Flamenco**    lighter construction    more percussive

**Mariachi**    come in different sizes

**Macaferri**    Gypsy Jazz    loud and penetrating

**Resonator**    steel body or steel cones act as a loudspeaker

#### **Curved neck**

**Flat top**    steel string acoustic    various sizes and construction methods

**Archtop**    f hole - top carved from solid piece of wood in violin style

**12 String**    either acoustic or electric - paired strings

**Electric**    either solid body, semi acoustic or jazz body

#### **Special feature**

**Extended range**    more than 6 strings

**Baritone**    longer scale neck, tuned 5th, 4th or 3rd lower

**Bass**    electric or acoustic, 4 or more strings

## Session 8

### Overview:

Examining musical instruments: The Piano

### Lecture:

Refer to prepared notes.

Link: <http://en.wikipedia.org/wiki/Piano>



## Session 9

### Overview:

Play “Animusic DVD” as introduction to: Examining musical instruments percussion

### Lecture:

Discuss the various categories of instruments (chordophone, idiophone, membranophone, aerophone and how they make their sounds). Examples and demonstration of percussion instruments in these categories. Obtain items to demonstrate.

Definite pitch (or tuned) percussion examples.

Activity: Get percussion instruments from store and have students form a percussion ensemble, playing to a metronome.

## Assessment : Worksheet: Instrument 1

**Elements tested:** CUSSMLT202A: 1 to 3  
CUSMPF201A: 1 to 2

### Questions:

1. The acoustic guitar is generally believed to have originated in a 3 string form in which region of the worldfi

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2. Name 1 of the pioneers of electric guitar design:

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3. Name at least 3 components of the electric guitar:

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4. What is the main difference between a guitar and a bassfi

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5. On a 12 string guitar, which pairs of strings are tuned to the same pitchfi

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6. What is the name given to female singers with the highest vocal registerfi

- a. Soprano
- b. Mezzo
- c. Soprano
- d. Contralto

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7. What is the name given to male singers with the lowest vocal registerfi

- a. Tenor
- b. Baritone
- c. Bass
- d. Castrato

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8. What part of the human anatomy produces the unique characteristics of our voicefi

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9. What is the name given to a group of people singing togetherfi

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10. How can a singer prepare for a performancefi

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11. What does the bracing underneath the soundboard of an acoustic guitar do?

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Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

Lecturer: \_\_\_\_\_ Date: \_\_\_\_\_

## Session 10

### Overview:

Examining musical instruments: Synthesizers.

Video: Ebony and Ivory (skip piano section).

### Lecture:

#### What is a Synthesizer?

A synthesizer is an electronic keyboard that can generate or copy virtually any kind of sound, making it able to mimic the sound of a traditional instrument, such as a violin or piano, or create brand new, undreamed of sounds. "Synthesize" means to make something new, often by putting it together from existing pieces.

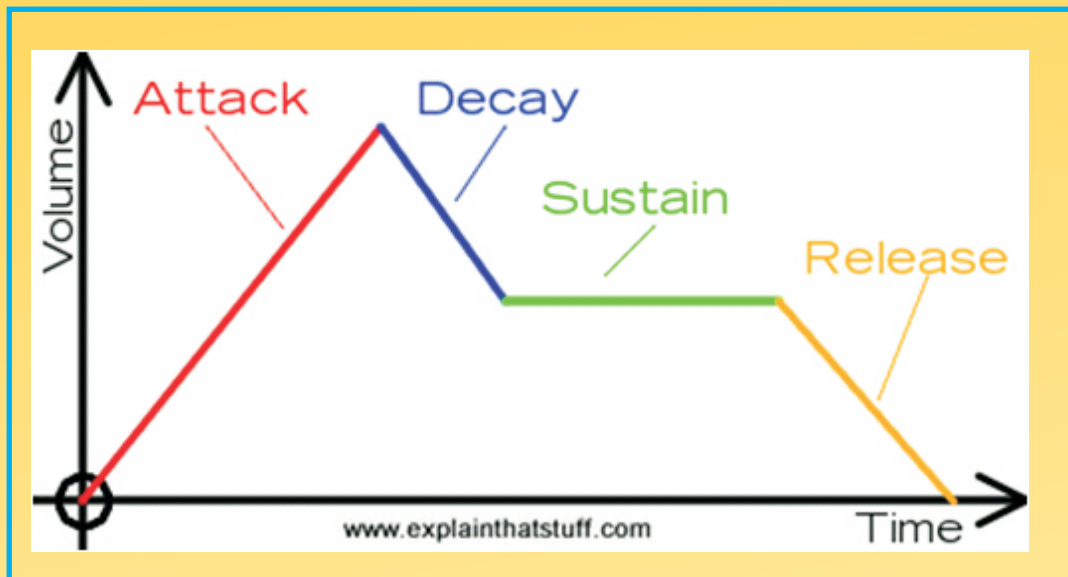
#### What makes one instrument sound different from another?

When two instruments play exactly the same musical note, at roughly the same volume, they can sound completely different. Waves! We can use an oscilloscope (an electronic graph-drawing machine, a bit like a cathode-ray TV, only it shows pictures of what waves look like) to see the difference.

If we play a pure musical note with a tuning fork, the oscilloscope shows an undulating hilly pattern called a sine wave. But if we play the same note with a trumpet, the wave will look more zig-zagged, like the teeth of a saw (it's usually called a saw-tooth wave). Now, if we play the same note again on a flute, we will see triangular waves. The shape of the sound waves, which is controlled by how the instrument pumps energy into the world around it - in other words, how it vibrates and makes the air around or inside it vibrate in sympathy - is one of the things that makes instruments sound different from one another.

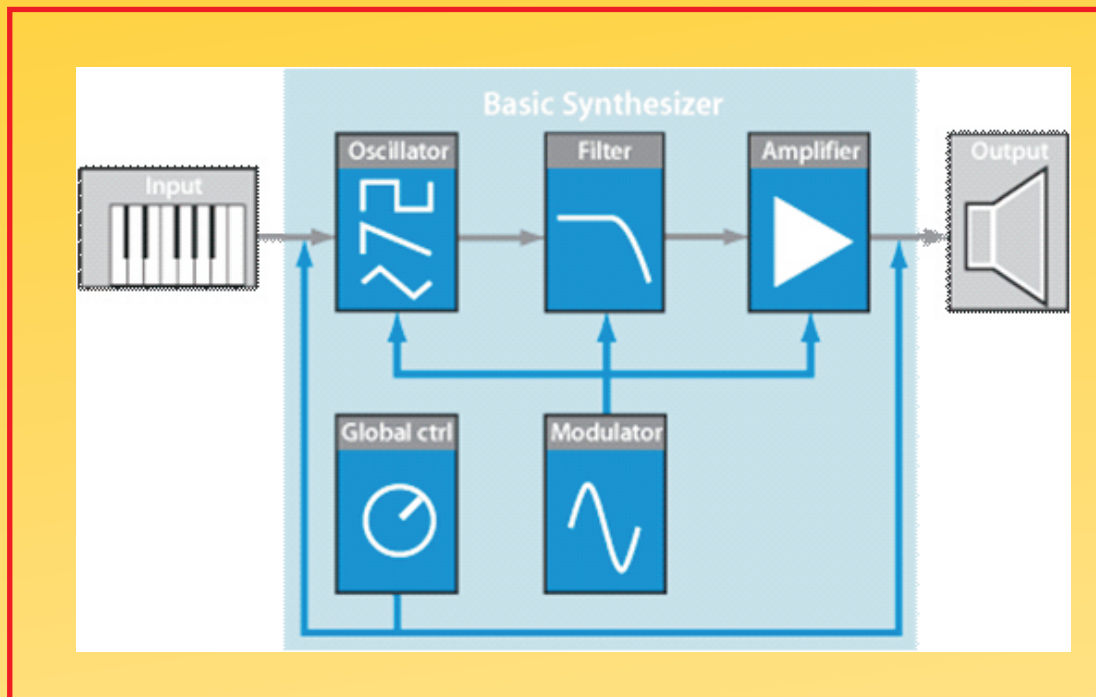
There are other factors too. An instrument doesn't just produce a single sound wave at a single pitch (frequency). Even if it's playing a steady note, it's making many different sound waves at once: it makes one note (called a fundamental frequency or first harmonic) and lots of higher, related notes called harmonics or overtones. Playing together, the harmonics make a dense, complex sound a bit like a barber's shop choir, with low voices and high voices all singing in tune. The more harmonics there are, the richer the sound.

A third factor that makes instruments different is the way the sound waves they make change in volume (amplitude) over time. Instruments don't make sounds the way lamps make light: it's not "all" or "nothing." If you press a piano key and release it, the sound changes volume gradually over time. First, it rises quickly (or "attacks") to its maximum volume. Next, the sound "decays" to a lower level and stays there or "sustains." Finally, when we let go of the key, the sound "releases" and dies down to silence.



In a piano, the attack phase is fairly slow and the sustain phase can be really long as the notes take a long time to die away. But with a flute, the attack phase is quicker and sharper, there is little decay, the sustain continues for as long as the flautist keeps blowing, and the release is also very fast. The changing pattern of sound volume plays a huge part in what makes one instrument sound different from another. We call the pattern of attack, decay, sustain, and release the ADSR envelope shape.

## How a Synthesizer creates sounds



## Signal generating and processing components

- **Oscillators:** Generate the basic signal. This is usually a waveform that is rich in harmonics. Many synthesizers offer more than one oscillator
- **Filter section:** Used to alter the basic signal by filtering out (removing) portions of the frequency spectrum. Many synthesizers offer a single filter, which is applied universally to all oscillator signals. Multioscillator synthesizers can provide multiple filters, allowing each oscillator signal to be filtered in a different way
- **Amplifier section:** Used to control the level of the signal over time. The amplifier features a module known as an envelope, which is broken down into several elements that provide level control for the beginning, middle, and end portions of your sound. Simple synthesizers generally offer a single envelope, which is used to control the oscillator (and filter) over time. More complex synthesizers can feature multiple envelopes

## Modulation and control components

- **Modulators:** Used to modulate the signal-generating and processing components. Modulations can be machine-based - automatically generated by a synthesizer component - or can be manually activated by using the modulation wheel, for example. Most synthesizers provide a component called an LFO (low frequency oscillator) to provide a waveform that modulates the signal.
- **Global controls:** Affect the overall characteristics of your synthesizer sound, such as glides between notes, pitch bend, monophonic or polyphonic playback, and more

## Oscillators

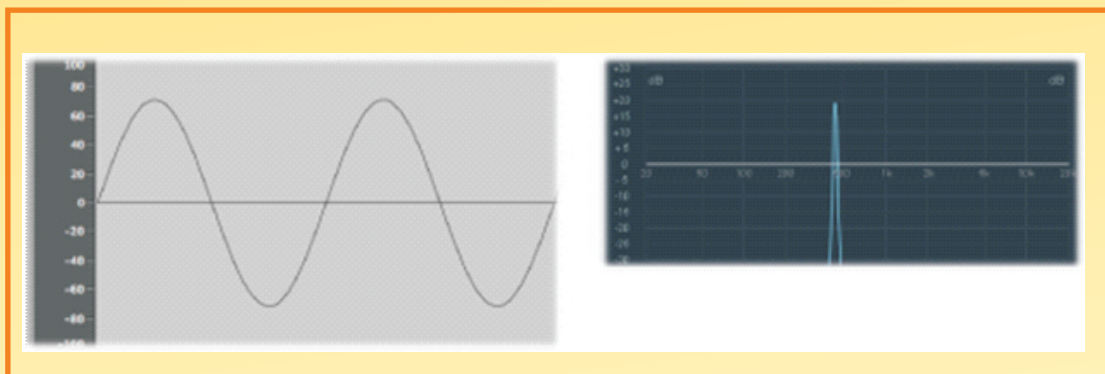
The audio signal of a synthesizer is generated by the oscillator. Usually you would choose from a selection of waveforms that contain differing types and varying amounts (more or fewer) of harmonics. The level relationships between the fundamental tone and the harmonics of the chosen waveform are responsible for the basic sound colour or timbre.

## Common synthesizer waveforms

The qualities of the most common synthesizer waveforms are discussed below.

### Sine wave

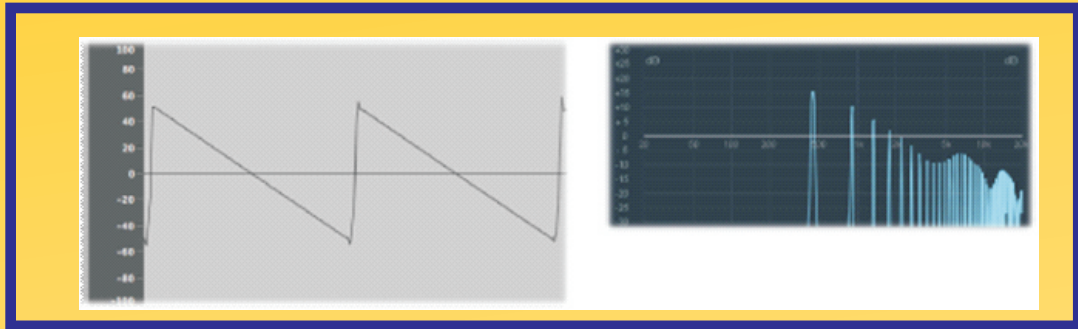
Clean and clear-sounding, a sine wave contains no harmonics but the first harmonic; in other words, it is the fundamental tone. The sine wave - used standalone - can be used to create “pure” sounds like whistles, the sound of wet fingers on the rim of a glass, tuning forks, and so on.





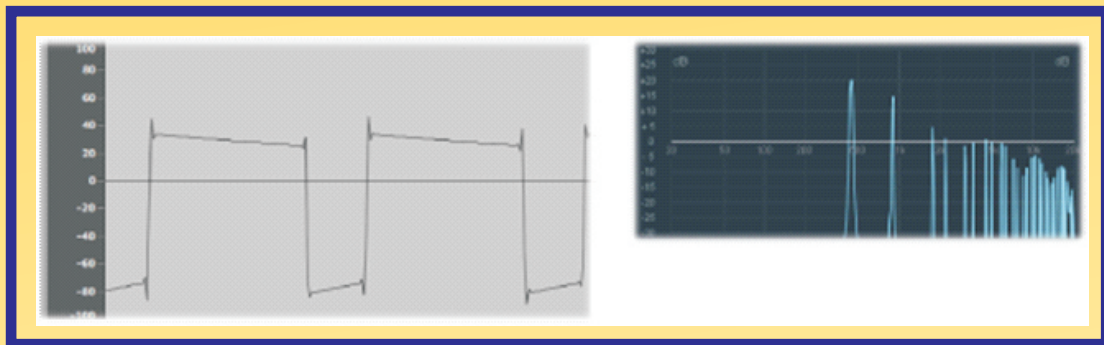
## Sawtooth

Clear and bright-sounding, a sawtooth wave contains both odd and even harmonics. It is ideal for the creation of string, pad, bass, and brass sounds.

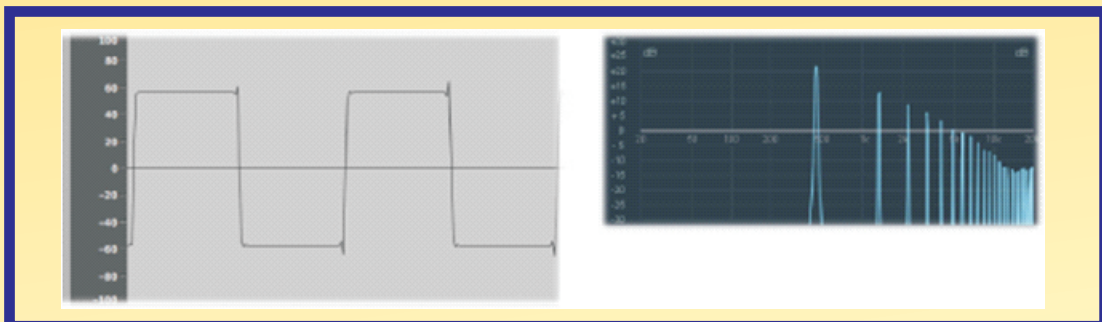


## Square and pulse waves

Hollow and woody-sounding, a square wave can contain a wide range of odd harmonics. It is useful when creating reed instruments, pads, and basses. It can also be used to emulate kick drums, congas, tom-toms, and other percussive instruments -often blended with another oscillator waveform, such as noise.

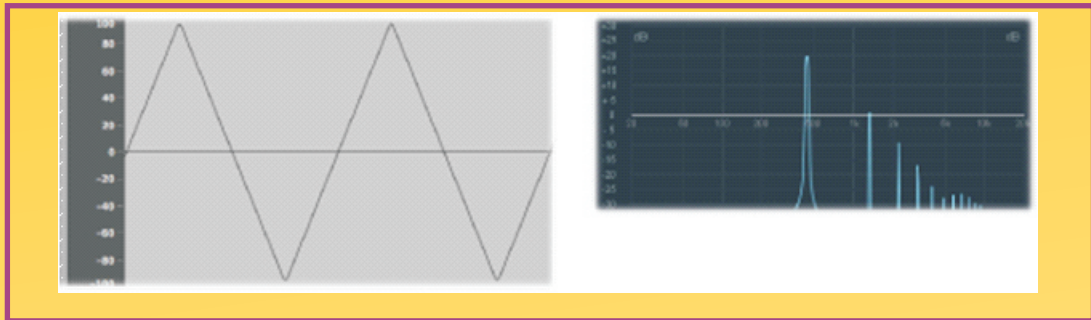


The square wave can be reshaped to make the waveform cycles - or pulses - more rectangular on many synthesizers, using a pulse width modulation (PWM) control. The more rectangular the wave becomes, the more nasal it sounds. When modulated in this way, the square wave is known as a pulse wave, and contains fewer harmonics. It can be used for reeds, basses, and brass sounds. See reshaping waveforms.



### Triangle

Like a square wave, a triangle wave contains only odd harmonics. Because a triangle wave's higher harmonics roll off faster than the ones of a square wave, the triangle wave sounds softer. It is ideal for creating flute sounds, pads, and vocal "oohs."



### Noise: Pink/red, blue, white

Noise is useful for emulating percussive sounds, such as snare drums, or wind and surf sounds, among others.

- white noise: The most common noise waveform found on synthesizers. White noise contains all frequencies - at full level - around a centre frequency
- Pink and red noise: These noise colours also contain all frequencies, but they are not at full level across the frequency spectrum. Pink noise decreases the level by 3 dB per octave (of higher frequencies). Red noise decreases the level by 6 dB per octave
- Blue noise: Blue noise, which is the reverse of pink noise, increases the level of all frequencies in higher octaves by 3 dB

### Reshaping waveforms

It is possible to deform the basic waveforms to create new waveforms. This results in a different timbre, or tonal colour, thus expanding the palette of sounds that can be created.

There are many ways to reshape a waveform. The most obvious would be altering the pulse width of a square wave. Other waveform-altering options include changing the phase angle, moving the start point of a waveform cycle, or simply combining multiple waveforms in multioscillator synthesizers.

When reshaped in these and other ways, the relationships between the fundamental tone and other harmonics change, thus altering the frequency spectrum and the basic sound being produced.

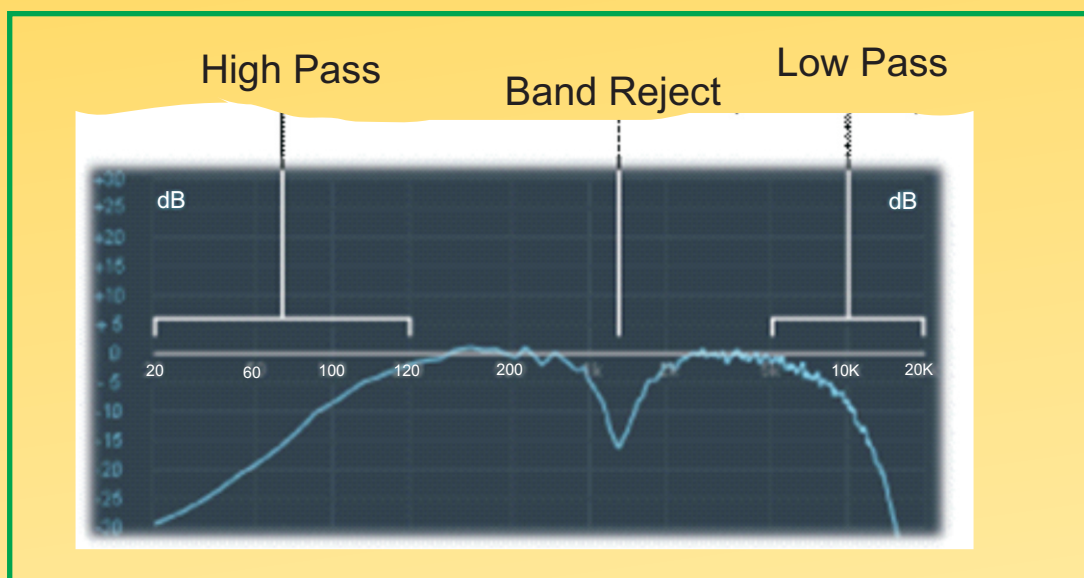
## Filters

The purpose of the filter in a subtractive synthesizer is to remove portions of the signal -the frequency spectrum - that is sent from the oscillators. After being filtered, a brilliant-sounding sawtooth wave can become a smooth, warm sound without sharp treble.

The filter sections of most subtractive synthesizers contain two primary controls known as cutoff frequency - often simply called cut off - and resonance. Other filter parameters can include drive and slope. The filter section of most synthesizers can be modulated by envelopes, LFO's, the keyboard, or other controls such as the modulation wheel.

## Types of filters

There are several filter types. Each has a different effect on various portions of the frequency spectrum:

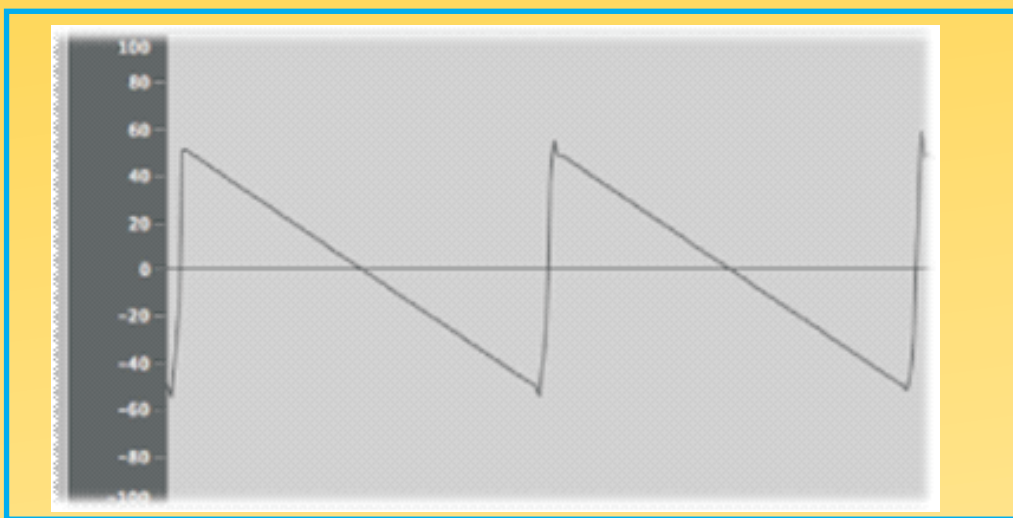


- ✎ lowpass filter: Low frequencies are passed; high frequencies are attenuated
- ✎ highpass filter: High frequencies are passed; low frequencies are attenuated
- ✎ bandpass filter: Only frequencies within a frequency band are passed
- ✎ band Reject filter: Only frequencies within a frequency band are attenuated
- ✎ allpass filter: All frequencies in the spectrum are passed, but the phase of the output is modified

### Cutoff frequency

The cutoff frequency, or cutoff, as the name suggests, determines where the signal is cut off. Simpler synthesizers offer only lowpass filters. Thus, if a signal contains frequencies that range from 20 to 4000 Hz, and a cutoff frequency is set at 2500 Hz, frequencies above 2500 Hz are filtered. The lowpass filter allows frequencies below the cutoff point of 2500 Hz to pass through, unaffected.

The Figure below shows an overview of a sawtooth wave ( $A = 220$  Hz). The filter is open, with cutoff set to its maximum value. In other words, this waveform is not being filtered.



The Figure below shows a sawtooth wave with the filter cutoff set to about a 50% value. This filter setting results in suppression of the higher frequencies and a rounding of the edges of the sawtooth wave, making it resemble a sine wave. Sonically, this setting makes the sound much softer and less brassy.

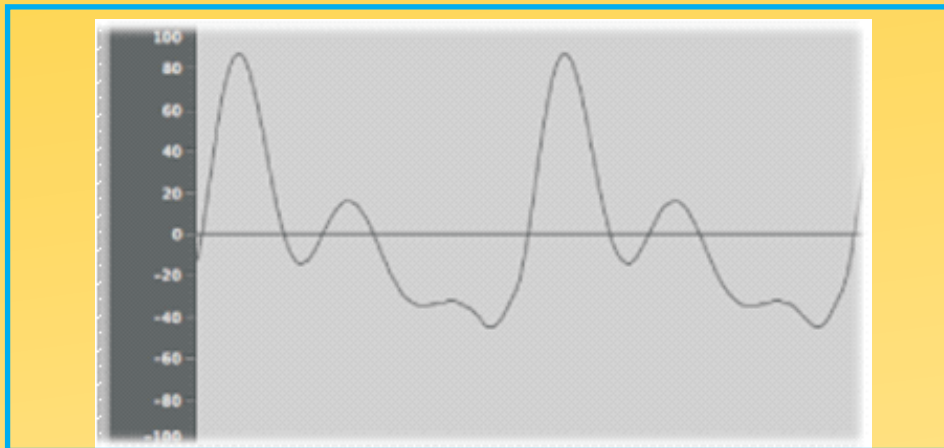




As you can see from this example, use of the filters to cut away portions of the frequency spectrum alters the waveform's shape, thus changing the timbre of the sound.

### Resonance

The resonance control emphasizes or suppresses signals around the cutoff frequency. The Figure below shows an ES1 sawtooth wave with a high resonance setting and the cutoff frequency set to 660 Hz, which is about 60%.



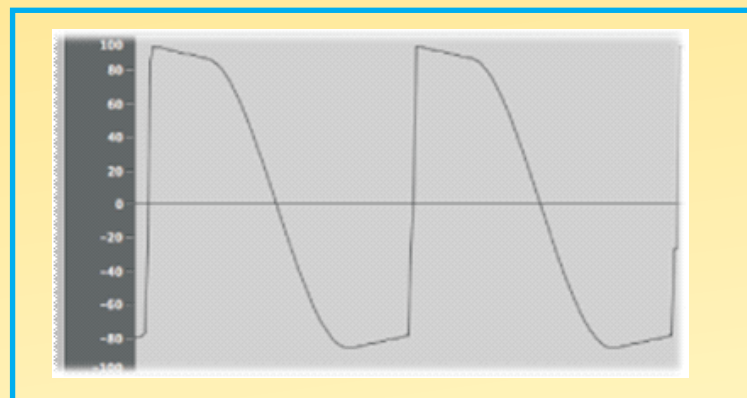
This resonant filter setting results in much brighter and harsher signals close to the cutoff frequency. Frequencies below the cutoff point are unaffected.

Once again, the overall result of using filter resonance is a change in the basic waveform's shape and, therefore, its timbre.

Very high filter resonance settings can be used to such an extreme degree that the filter begins to self-oscillate, resulting in the filter generating a sine wave.

### Drive

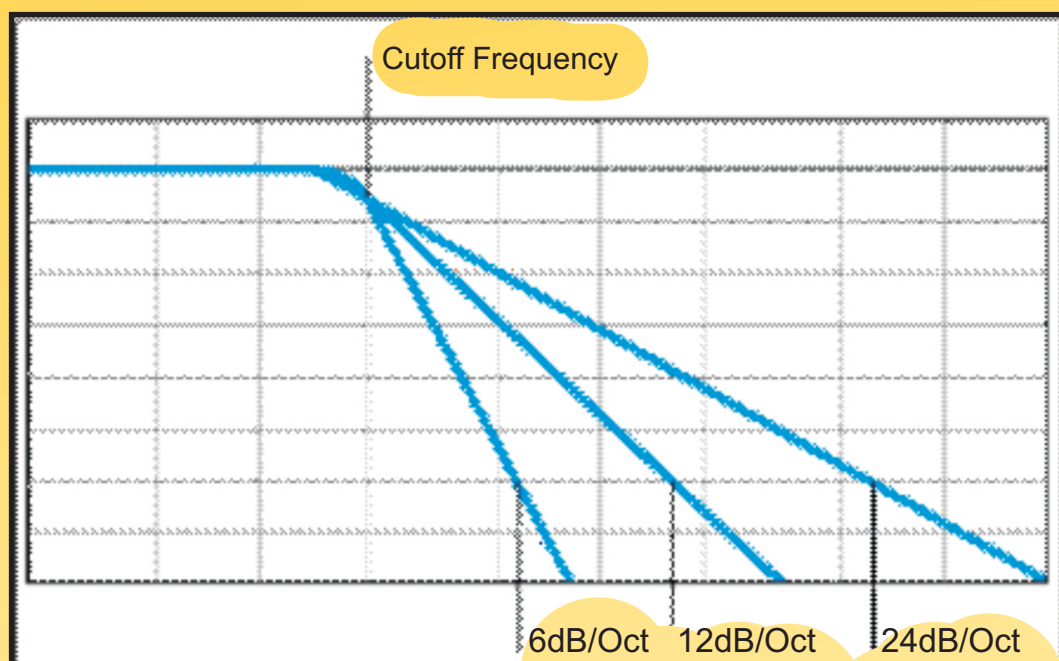
Drive adds an amount of gain to the waveform as it enters the filter- an input gain control - thus overdriving the filter and distorting the waveform. This waveform distortion changes the timbre of the sound, making it much harsher.



The Figure shows an unfiltered sawtooth wave, with Drive set to about 80%. Notice that the wave cycles touch the floor and ceiling of the filter's dynamic range.

### Filter Slope

As discussed earlier, a filter will cut off the signal at the set cutoff frequency. This cutoff doesn't happen abruptly but rather at a given slope, which is measured in decibels (dB) of gain reduction per octave. Put another way, you can define how steep the “cliff” is at the cutoff point by choosing a relatively severe or gentler slope.



### Modulation

Without modulation, sounds tend to be boring and fatiguing to the ear. They also sound synthetic, rather than natural, in the absence of some type of sonic modulation. The most obvious type of modulation is vibrato, which is used by orchestral string players to add animation to an instrument's pitch.

To make sounds more interesting, you can use various synthesizer controls to modulate basic sound parameters.

### LFO controls

The LFO generally offers the following controls:

- **Waveform:** Allows you to choose the type of waveform (triangle waves and square waves are seen most often). Triangle waves are useful for filter sweeps (slow changes to the filter cutoff frequency) or when simulating an ambulance siren (slow changes to the oscillator frequency). The square waveform is useful for

- frequency/rate: Determines the speed of the waveform cycles produced by the LFO. When set to low values, very slow ramps are produced, making it easy to create sounds such as ocean waves rolling in (when white noise is chosen as the waveform in the main oscillator)
- sync mode: Allows you to choose between free running (a user-defined LFO rate) or synchronization with an external tempo source (such as a host application)

### **LFO envelopes**

The LFO can also be controlled with an envelope generator in some synthesizers. As an example of where this might be useful, imagine a sustained string section sound where vibrato is introduced a second or so into the sustained portion of the sound. If this can happen automatically, it allows you to keep both hands on the keyboard.

In certain synthesizers, a simple envelope generator is included for this precise purpose. Often, this envelope consists only of an attack parameter, or occasionally it includes decay or release options. These parameters perform in the same fashion as the amplitude envelope parameters, but they are limited to control of LFO modulations.

### **Global controls**

This section covers global controls that affect the overall output signal of your synthesizer.

The most obvious global control is the level control, which sets the overall loudness of your sound. For more information about the level control, see envelopes in the amplifier section.

### **Other key global controls include the following:**

- glide (sometimes called portamento): Used to set the amount of time that it takes for one note pitch to slide up or down to another note pitch. This control is useful for emulating wind instruments that slide from note to note, rather than move directly to another clear and distinct pitch
- bender/bend range: This control is generally hard-wired to a Pitch Bend wheel on a keyboard. As the name suggests, moving the wheel up or down from its centred position bends the pitch (the oscillator frequency) up or down. The Bender/Bend Range parameter usually has an upper and lower limit of one octave but is typically set to around three semitones up or down. This setting is ideal for emulating small (or extreme) pitch fluctuations that occur in some instruments - such as when moving between notes with a trumpet, or bending the strings during a scorching guitar solo

- voices: Synthesizers have a limit to the number of notes that can be produced simultaneously. Producing notes simultaneously is known as the polyphony (literally, this means “many voices”) of the instrument. The Voices parameter sets an upper limit to the number of notes that can be played at a given time
- unison: Used to “stack” voices - with the unison voice being heard one octave above the frequency of the played note. Because two voices are being used when you play a note, unison has two effects - it makes the sound richer and fuller, and it halves the polyphony.
- trigger mode: Trigger mode determines how the polyphony of the instrument is handled when the number of notes played exceeds the number of available voices. Trigger Mode also allows you to assign legato mode. Essentially, this control changes the way the synthesizer responds to your playing technique and is invaluable when you are emulating monophonic instruments, such as flutes, clarinets, and trumpets. When you use the trigger mode control, if you assign a last note priority, a playing note will be cut off by playing another note.
- last note priority: When new notes are triggered while all voices are playing, the synthesizer frees up polyphony (voices) by ending the notes played earliest. This is the default trigger mode of Logic Express synthesizers when in a monophonic mode.
- first note priority: Notes played earlier are not stopped. In this mode you need to stop playing notes in order to play a new one after you have reached the limit of the polyphony (voices) of the instrument.

Note: The trigger mode parameter can also allow you to set priorities for lower- or higher-pitched notes when playing monophonically (one voice at a time) in some synthesizer designs. There are many other global controls found on different synthesizer models that have an impact on your overall sound.

**Activity:** Get synthesizer and have students break into groups and have a go at trying to create sounds.



## Session 11

### Overview:

Basic music theory in preparation for ensemble playing.

Introduction to music notation, time signatures, scales.

### Lecture:

The music staff -lines and spaces and ledger lines - what they are named and how to remember them.

A staff is made up of 5 horizontal lines and 4 spaces.

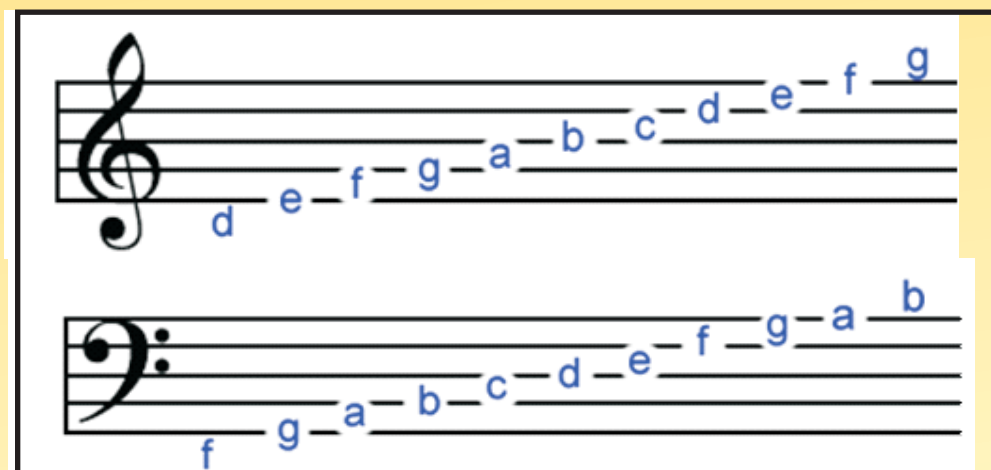


Pitches are named after the first seven letters of the alphabet (A B C D E F G).



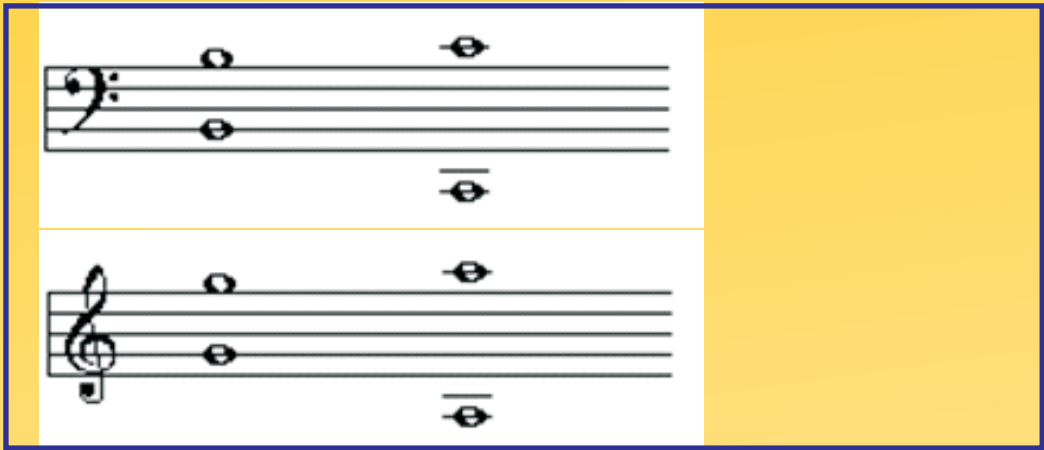
A clef is a musical symbol placed at the beginning of the staff that determines the letter names of the lines and spaces.

The 2 main clefs are the treble and the bass:



Ledger lines are an extension of the staff. They are additional lines both above and below which are parallel to the staff. Each ledger line

contains one note.



Value of notes.

Each note has a specific duration.

Name	Note	Rest
Whole Note Semi Breve		
Half Note Mini M		
Quarter Note Crotchet		
Eighth Note Quaver		
Sixteenth Note Semi Quaver		

## Time, signatures, bars and beats

Meter is the regular recurring pattern of strong and weak beats of equal duration; also known as time. The meter or time signature in a musical composition is indicated by a fraction, and located at the beginning of a piece of music. The lower number of the fraction tells what kind of note receives one beat. The upper number tells how many beats are in a measure.

In Western music there are two types of meter, simple and compound. In simple meter the upper number is either 2, 3, or 4. Each beat is subdivided by two.



In compound meter the upper number is either 6, 9, or 12. Each beat is a dotted note and subdivided into groups of three beats.

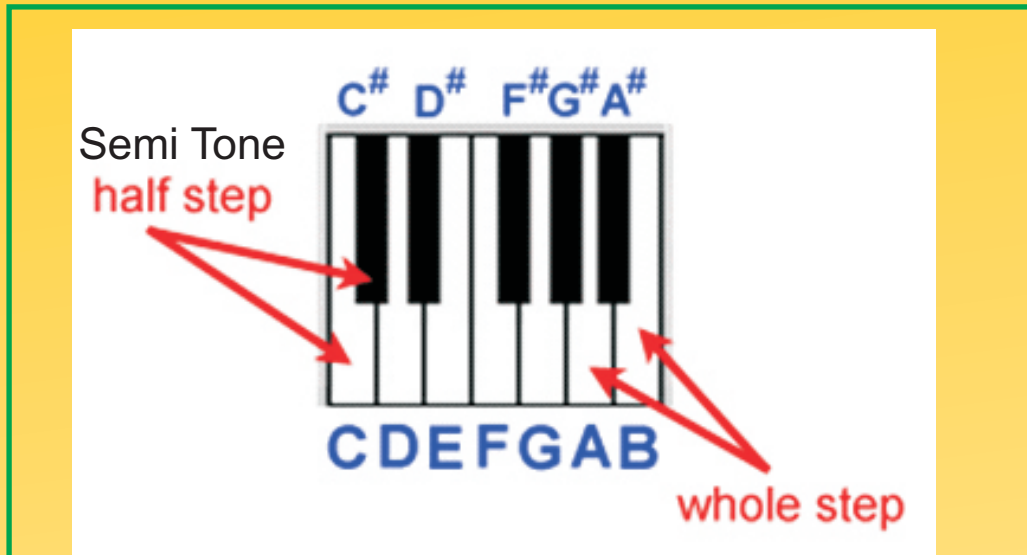
Scales -how to work out the notes in a scale (e.g. Maj TTSTTTS).

## Intervals:

An interval is the distance between two notes. Intervals are always counted from the lower note to the higher one, with the lower note being counted as one. Intervals come in different qualities and size. If the notes are sounded successively, it is a melodic interval. If sounded simultaneously, then it is a harmonic interval.

The smallest interval used in Western music is the half step. A visual representation of a half step would be the distance between a consecutive white and black note on the piano. There are two exceptions to this rule, as two natural half steps occur between the notes E and F, and B and C.

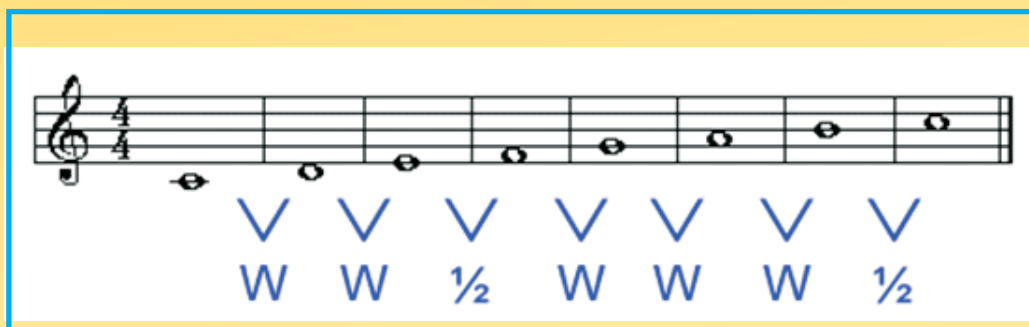
A whole step is the distance between two consecutive white or black keys. It is made up of two half steps.



### Scales

There are many different types of scales. They are the backbone of music.

A major scale is a series of 8 consecutive notes that use the following pattern of half and whole steps: **Listen**



Minor Scales come in three forms: Natural, melodic, and harmonic.

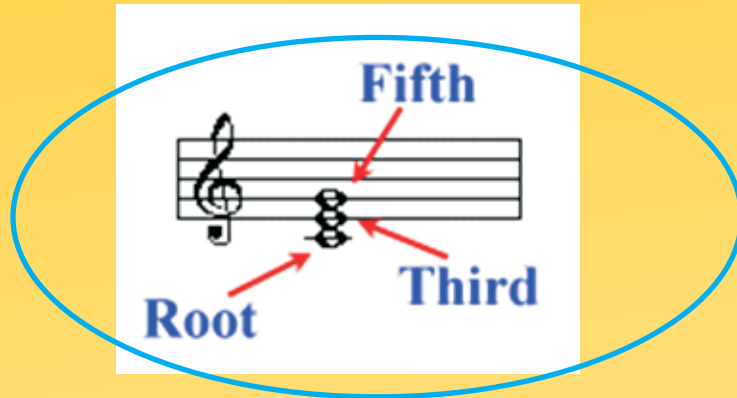
Natural minor scales use the following pattern of half and whole steps: **Listen**



## Music Theory - Chords and Symbols

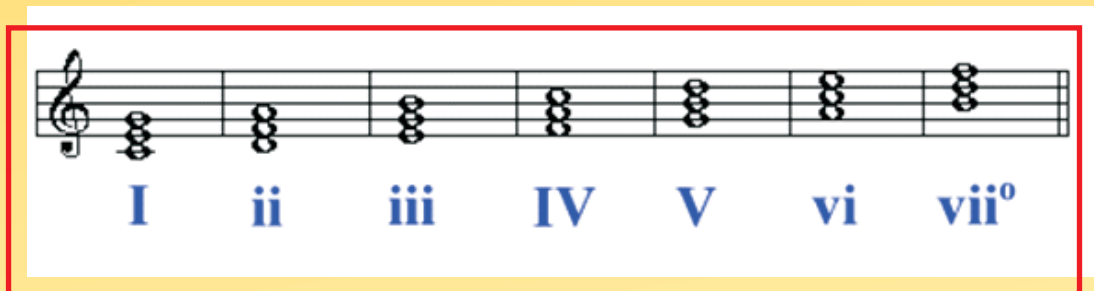
### Triad

A triad is a group of three notes having a specific construction and relationship to one another. They are constructed on 3 consecutive lines or three consecutive spaces. Each member of the triad is separated by an interval of a third. The triad is composed of a root, third, and fifth.



### Roman numeral analysis

In the early 1800's, German composers started to use roman numerals to symbolise harmony. Each note in a scale can have a triad or chord built above it. Upper case (major) and lower case (minor). Roman Numerals are used to indicate the type of chord. I, IV, V are major triads/chords, ii, iii, vi are minor triads/chords, and vii is diminished.



**Activity:** Complete practice sheets.

### Session 12

#### Overview:

Playing in an ensemble.

#### Lecture:

What is an ensemble?

Brainstorm ideas for successful ensemble playing.

**Exercise:** Class to each get an acoustic instrument (guitar, bass, percussion etc) and try playing as a group.

After first attempt, debrief and discuss what worked and what didn't.

Try again using lessons learned from the first attempt.

Continue lesson with other songs.

## Assessment : Worksheet: Instrument 2

Elements tested: CUSMLT202A: 1 to 3  
CUSMPF201A: 1 to 2

### Questions:

1. What family of instruments does the cabassa and guiro belong to?  
\_\_\_\_\_  
\_\_\_\_\_
2. What is the **snare** on a snare drum generally made of?  
\_\_\_\_\_  
\_\_\_\_\_
3. In a synthesizer, what do the following letters denote?
  - a. A
  - b. D
  - c. S
  - d. R
4. How do drums produce a sound?  
\_\_\_\_\_  
\_\_\_\_\_
5. Give an example of a Definite Pitch Idiophone:  
\_\_\_\_\_  
\_\_\_\_\_
6. At the bass end of the piano, how many strings are usually assigned to each note?
  - a. 1
  - b. 2
  - c. 3
7. Draw the following wave shapes:
  - a. Sine
  - b. Saw
  - c. Triangle
  - d. Square

## Music Production-XI

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8. In a piano, what is the name given to the device that strikes the strings to create the sound?

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9. What is the purpose of **dampers** in a piano?

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10. Who invented the piano?

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11. What is the electronic device used to generate sound in an analogue synthesizer?

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12. What type of synthesizer has the actual sound waves modified by the electronic circuitry?

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13. Who is known as the pioneer of the modern synthesizer?

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Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

Lecturer: \_\_\_\_\_ Date: \_\_\_\_\_



## **Sessions 13, 14, 15, 16, 17**

### **Overview:**

Playing in an ensemble

**Activity:** Playing in an ensemble

### Assessment : Direct Observation Checklist Enable Playing

**Elements tested:** BSBWOR203A 1 to 3  
CUSSMLT202A: 1 to 3  
CUSMPF201A: 1 to 2

#### Task:

Students are to demonstrate their ability to demonstrate a range of skills required for ensemble playing.

Ensemble Playing Task Guidelines	Yes/No	Comments
The student is able to exhibit the necessary listening skills to be sympathetic with other members of the ensemble.		
The student is able to demonstrate the ability to participate in ensemble playing.		
The student is able to observe OHS guidelines when undergoing this activity.		

Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

Lecturer: \_\_\_\_\_ Date: \_\_\_\_\_

**Assessment : Direct Observation Checklist Ensemble Playing**

**Elements tested**      BSBWOR203A   1 to 3  
                                  CUSMLT202A:   1  
                                  CUSMPF201A:   1 to 2

Ensemble Playing Task Guidelines	Yes/No	Comments
Was the student able to exhibit the necessary listening skills to be sympathetic with other members of the ensemblefi		
Was the student able to demonstrate the ability to participate in ensemble playingfi		
Was the student able to observe OHS guidelines when undergoing this activityfi		

### Assessment : Direct Observation Checklist: Studio Recording

Elements tested

BSBWOR203A 1 to 3

#### Task:

Studio Recording Task Guidelines	Yes/No	Comments
The student to demonstrate an understanding of basic studio etiquette, including lead rolling, microphone stand usage, microphone selection and placement.		
The student to demonstrate the ability to use the facilities of the studio mixing desk to set a correct gain level, route a signal through the channel and send a signal to the headphones.		
The student to demonstrate the ability to adhere to OHS guidelines		

Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

Lecturer: \_\_\_\_\_ Date: \_\_\_\_\_

## Assessment 1: Worksheet: Music Culture MARKING KEY

### Marking Key:

1. Apart from music, what are 3 other aspects of a society's culture?  
Answers could include art, food, language, dance, traditions, beliefs, religion
2. List 4 characteristics that define music:  
Answers could include rhythm, tone, melody, harmony, texture, timbre etc
3. What were 3 areas of the world that influenced early American music?  
Africa, Europe, Great Britain, Ireland, Latin America, Indigenous
4. Which decade in the 1900's did blues become part of American popular music?  
1920's
5. What other styles of music influences contributed to American country music?  
Answers could include Blues, Jazz, Folk, Spirituals
6. Name 1 famous American punk band of the 1970's?  
Answers could include The Ramones, Talking Heads, Blondie, Patti Smith
7. Describe what you understand by the term British Invasion?  
The wave of British Band who dominated American music charts in the 1960's
8. What world event led to the influx of American music into Britain in the 1940's?  
World War II music was brought over by the American troops.
9. Which American band did the Beatles use as a band name influence?  
The Crickets
10. Which Australian performer of the 1950's was known as the Wild One?  
Johnny O'Keefe
11. Who is the lead singer of Cold Chisel?  
Jimmy Barnes
12. Name the Northern Territory band of the 1980's and 1990's that brought indigenous Australian music into mainstream popular music:  
YothuYindi

## Assessment 4: Worksheet: Instruments 1

### Marking Key:

1. The acoustic guitar is generally believed to have originated in a 3 string form in which region of the world?  
**Middle East - Egypt**
2. Name 1 of the pioneers of electric guitar design:  
**Leo Fender, Les Paul**
3. Name at least 3 components of the electric guitar:  
**Neck, fingerboard, body, bridge, tuning heads, headstock, pickups, electrics**
4. What is the main difference between a guitar and a bass?  
**The bass has thicker strings and is pitched lower**
5. On a 12 string guitar, which pairs of strings are tuned to the same pitch?  
**The top 2, E and B**
6. What is the name given to female singers with the highest vocal register:  
  - a. **Soprano**
  - b. Mezzo
  - c. Tenor
  - d. Contralto
7. What is the name given to male singers with the lowest vocal register?  
  - a. Tenor
  - b. Baritone
  - c. **Bass**
  - d. Castrato
8. What part of the human anatomy produces the unique characteristics of our voice?  
**Our voice box**
9. What is the name given to a group of people singing together?  
**Choir**
10. How can a singer prepare for a performance?  
**Vocal warm up exercises**
11. What does the bracing underneath the soundboard of an acoustic guitar do?  
**Strengthening**

## Performance Specialist Assessment 5 : Worksheet: Instrument 2

### MARKING KEY

1. What family of instruments does the cabassa and guiro belong to?  
**Percussion**
2. What is the **snare** on a snare drum generally made of?  
**Coils of wire strands**
3. In a synthesiser, what do the following letters denote?  
a. A ttack      b. D ecay      c. S ustain      d. R elease
4. How do drums produce a sound?  
**The skin vibrates in air**
5. Give an example of a Definite Pitch Ideophone:  
**Xylophone, marimba, glockenspiel, steel drum, tubular bells**
6. At the bass end of the piano, how many strings are usually assigned to each note?  
a. 1      b. 2      c. 3
7. Draw the following wave shapes?  
a. Sine      b. Saw      c. Triangle      d. Square
8. In a piano, what is the name given to the device that strikes the strings to create the sound?  
**Hammer**
9. What is the purpose of **dampers** in a piano?  
**To mute the string**
10. Who invented the piano?  
**BartolomeoCristofori**
11. What is the electronic device used to generate sound in an analogue synthesiser?  
**Oscillator**
12. What type of synthesiser has the actual sound waves modified by the electronic circuitry?  
**Analogue**
13. Who is known as the pioneer of the modern synthesiser?  
**Bob Moog**

## SECTION - IV

### LEARNING PLAN - CLUSTER

Cluster Title	Sound Production Specialist	
National code and Unit title	BSBWOR203A CUSSOU201A CUETGE15B	Work effectively with others Assist with sound recordings Handle physical elements safely during bump in/bump out
Resource	<b>Class notes:</b> <ul style="list-style-type: none"> <li>• Live class notes</li> <li>• Studio location</li> </ul> <b>Power point presentations</b> <ul style="list-style-type: none"> <li>• Small PA systems</li> <li>• Medium PA systems</li> </ul> <p>Work effectively with others</p> <ol style="list-style-type: none"> <li>1. Develop effective workplace relationships</li> </ol>	
Elements	<b>Assist with sound recordings</b> <ol style="list-style-type: none"> <li>1. Assist with the prerecording checks</li> <li>2. Contribute to recording operations</li> </ol> <b>Handle physical element safely during bump in/bump out</b> <ol style="list-style-type: none"> <li>1. Prepare physical elements for transportation</li> <li>2. Load/unload physical elements</li> <li>3. Check condition of physical elements</li> <li>4. Work effectively with others</li> </ol> <b>Evidence of the following is essential</b> <ul style="list-style-type: none"> <li>• providing support to team members to ensure goals are met</li> <li>• seeking feedback from clients and/or colleagues and taking appropriate action</li> <li>• knowledge of appropriate conflict resolution techniques</li> </ul>	
Critical aspects of evidence	<b>Assist with sound recordings</b> Evidence of the ability of <ul style="list-style-type: none"> <li>• apply OHS principles of safe listening to day to day work activities</li> <li>• use a range of industry current sound equipment and accessories</li> <li>• work cooperatively in a production environment</li> </ul>	



	<p>Handle physical elements safely during bump in/bump out The following evidence is critical to the judgement of competence in this unit.</p> <ul style="list-style-type: none"><li>• knowledge of safe manual handling techniques for various types equipment</li><li>• ability to move, pack and load equipment under instruction using safe manual handling techniques.</li></ul>
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### CUSSOU201A: Assist with Sound Recordings

#### Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to assist with sound recordings using a variety of recording equipment in a studio or live environment.

#### Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1.Assist with prerecording <b>checks</b>	<ul style="list-style-type: none"><li>1.1 Clarify <b>documentation</b> and <b>consumables</b> for <b>recording production</b> with appropriate persons</li><li>1.2 Connect <b>sound equipment and accessories</b> according to safety, technical and <b>production requirements</b></li><li>1.3 Refer faults and problems to <b>appropriate persons</b></li></ul>
2. Contribute to Recording operations	<ul style="list-style-type: none"><li>2.1 Follow directions about the <b>placement and movement</b> of <b>microphones</b> and <b>microphone accessories</b></li><li>2.2 Assist with <b>sound check</b> to ensure levels and <b>characteristics of recorded sound</b> meet required standards</li><li>2.3 Confirm <b>signal-processing</b> requirements with appropriate persons and make test recordings to ensure no audible defects are present</li><li>2.4 Listen to sound recording for audible defects and extraneous background sound and communicate problems to appropriate persons</li><li>2.5 Log recordings and ensure labelling is accurate, legible, current and within production requirements</li><li>2.6 Disconnect sound equipment and accessories according to safety, technical and production requirements</li><li>2.7 Communicate appropriately with other team members, performers or customers during the completion of tasks</li><li>2.8 Clean <b>work environment</b> after use and restore to pre-recording condition.</li></ul>

## Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

### Required skills

Literacy skills sufficient to:

- log and label recorded material
- note and report system faults and problems
- read and understand recording documentation

Numeracy skills sufficient to calculate duration and capacity of recording media

Communication skills sufficient to:

- liaise with sound production/recording personnel
- understand and follow instructions
- respond positively to constructive feedback on own performance

Learning skills sufficient to maintain currency of knowledge of recording equipment upgrades

Planning and organisational skills sufficient to:

- prioritise work tasks
- meet deadlines
- seek expert assistance when problems arise

Problem-solving skills sufficient to identify and refer system faults and problems to sound-production personnel

Teamwork skills sufficient to work effectively with sound-production personnel

Technology skills sufficient to work with a variety of sound-recording equipment

### Required knowledge

Basic principles and techniques of sound recording, including:

- audible defects in analogue and digital technologies
- identification/logging requirements
- operational principles of microphones, including microphone placement
- operational/technical limitations of recording mediums
- recording formats and technical standards signal-to-noise ratio, signal phase and audio level/headroom control

OHS principles of safe listening, including safeguards against hearing loss

## Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

<b><i>Documentation</i></b> may include:	<ul style="list-style-type: none"> <li>• cue sheets and track sheets</li> <li>• dubbing charts</li> <li>• equipment instructions</li> <li>• OHS requirements</li> <li>• organizational standards</li> <li>• performers' requirements</li> <li>• production schedule and set-up reports</li> <li>• shot lists</li> <li>• sound and audio reports</li> <li>• story boards</li> <li>• technical manuals.</li> </ul>
<b><i>Consumables</i></b> may include:	<ul style="list-style-type: none"> <li>• audiotape</li> <li>• compact discs (CDs)</li> <li>• cue sheets and track sheets</li> <li>• digital versatile discs (DVDs)</li> <li>• masking tape, marker pens and labels</li> <li>• memory cards</li> <li>• mini discs (Mds).</li> </ul>
<b><i>Recording production</i></b> may include:	<ul style="list-style-type: none"> <li>• commercial</li> <li>• print advertisement</li> <li>• corporate video</li> <li>• feature film and/or video</li> <li>• filmed event and/or performance</li> <li>• interactive digital media product</li> <li>• internet production</li> <li>• music recording and/or video</li> <li>• promotional trailer</li> <li>• radio broadcast</li> <li>• short film and/or video</li> <li>• television program</li> <li>• training film and/or video</li> </ul>

<p><b>Sound equipment and accessories</b> may include:</p>	<ul style="list-style-type: none"> <li>• amplifiers</li> <li>• analogue to digital converters</li> <li>• cables</li> <li>• computer technology and associated software</li> <li>• digital and analogue recording devices</li> <li>• digital audio players</li> <li>• headphones</li> <li>• microphones and accessories</li> <li>• mixing consoles and desks</li> <li>• monitors and speakers</li> <li>• signal processors and plug-ins.</li> </ul>
<p><b>Production requirements</b> may include</p>	<ul style="list-style-type: none"> <li>• attributions</li> <li>• audience</li> <li>• budget</li> <li>• confidentiality</li> <li>• content</li> <li>• contractual arrangements</li> <li>• copyright</li> <li>• deadlines</li> <li>• direct quotes</li> <li>• duration</li> <li>• intellectual property</li> <li>• interviews</li> <li>• location</li> <li>• purpose</li> <li>• schedule</li> <li>• style.</li> </ul>
<p><b>Appropriate persons</b> may include</p>	<ul style="list-style-type: none"> <li>• artists, musicians and performers</li> <li>• audio and sound engineers</li> <li>• audio and sound technicians</li> <li>• dubbing machine operators</li> <li>• broadcasters</li> <li>• directors, producers and photographers</li> <li>• post-production editors and mixers</li> <li>• program managers</li> <li>• sound designers and editors</li> <li>• sound effects personnel</li> <li>• video and sound recorders.</li> </ul>

<b>Placement and movement</b> of equipment may involve	<ul style="list-style-type: none"> <li>• observing safety and technical requirements</li> <li>• avoiding extraneous and unwanted noise, e.g. from cables</li> <li>• with screen productions: <ul style="list-style-type: none"> <li>• ensuring that equipment is not in frame</li> <li>• aiming a boom microphone upwards or downwards depending on the shot</li> </ul> </li> <li>• placing microphones in more than one position to capture the required sound</li> <li>• perspective.</li> </ul>
<b>Microphones</b> may include	<ul style="list-style-type: none"> <li>• boundary (PZM)</li> <li>• capacitor/condenser</li> <li>• contact</li> <li>• digital</li> <li>• directional</li> <li>• dual-element</li> <li>• dynamic</li> <li>• headset</li> <li>• lapel</li> <li>• low and/or high impedance</li> <li>• microphone systems</li> <li>• noise cancelling</li> <li>• shotgun.</li> </ul>
<b>Microphone accessories</b> may include	<ul style="list-style-type: none"> <li>• boom poles</li> <li>• cables</li> <li>• clips</li> <li>• connectors</li> <li>• housing</li> <li>• pop filters</li> <li>• shock mounts</li> <li>• stands</li> <li>• windscreens</li> </ul>
<b>Sound check</b> may include checking	<ul style="list-style-type: none"> <li>• levels</li> <li>• frequency response</li> <li>• phase relationships</li> <li>• signal-to-noise ratio</li> </ul>

<p><b>Characteristics of recorded sound</b> may include</p>	<ul style="list-style-type: none"> <li>• frequency response</li> <li>• phase relationships</li> <li>• signal-to-noise ratio level</li> <li>• mono/stereo/5.1 surround sound</li> <li>• spatial position and image</li> <li>• balance</li> <li>• tonal quality</li> <li>• perspective</li> <li>• acoustic</li> <li>• dynamic range</li> </ul>
<p><b>Signal processing</b> may include</p>	<ul style="list-style-type: none"> <li>• amplitude (dynamic) signal processing</li> <li>• noise processing</li> <li>• spectrum signal processing</li> <li>• time signal processing.</li> </ul>
<p><b>Work environment</b> may include:</p>	<ul style="list-style-type: none"> <li>• dubbing theatre</li> <li>• on location</li> <li>• outside broadcast</li> <li>• post-production studio</li> <li>• recording studio</li> <li>• sound stage.</li> </ul>



## CUETGE15B Handle physical elements during bump in bump out

### Unit descriptor:

This unit describes the skills and knowledge required to assemble, pack and load/unload physical elements under supervision for any production within the cultural industries. This unit is introductory in nature and focuses on safe manual handling and general knowledge of the bump in/bump out process and types of equipment. It does not include the specialised bump in/bump out procedures and knowledge required by technicians.

Elements and Performance Criteria	
Elements	Performance Criteria
1. Prepare physical elements for transportation	<p>1.1. Assemble/dismantle <b>physical elements</b> in the correct order in accordance with instructions to ensure ease of packing, loading, unloading and installation</p> <p>1.2. <b>Pack</b> physical elements safely using appropriate <b>techniques and materials</b> to avoid damage during <b>transportation</b></p> <p>1.3. Correctly identify, prepare and pack any tools required for bump in/bump out</p>
2. Load/unload physical elements	<p>2.1. Load/unload physical elements in the required order taking care to avoid damage</p> <p>2.2. Use safe manual handling techniques throughout the loading/unloading process to avoid injury or damage</p> <p>2.3. Install or position physical elements in appropriate work or storage area in accordance with directions</p> <p>2.4. Identify any hazardous items and load these in a manner which minimises health and safety risk</p> <p>2.5. Inspect load prior to transportation to ensure that all items are loaded appropriately, and make adjustments as required</p> <p>2.6. Clear and clean work areas in accordance with organisational procedures</p>
3. Check condition of physical elements	<p>3.1. Check the condition of physical elements to ensure that no damage has occurred during bump-in/bump-out</p> <p>3.2. Identify any repairs required and report to the <b>appropriate personnel</b> for action, using correct documentation as required</p>

## Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

### Required skills:

- literacy skills sufficient to read simple work instructions, equipment lists and safety directions.
- numeracy skills sufficient to count/tally equipment and other physical elements self-management skills sufficient to meet deadlines.
- problem-solving skills sufficient to anticipate and resolve minor equipment set-up problems ability to work as a member of a production team.

### Required knowledge

- general knowledge of the bump in/bump out process for different types of production, including typical procedures and processes and the roles and responsibilities of different personnel
- general knowledge of the typical physical elements used for different types of production
- typical locations for different physical elements within a production venue
- safe manual handling techniques and the broader safety issues associated with the movement of physical elements
- relevant organizational and/or legislative occupational health and safety requirements
- packing materials and techniques used for different types of equipment
- techniques for loading and stowing equipment for safe transportation
- the range of tools commonly required during the bump in /bump out process

### RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

<b>Physical elements</b> may include any equipment or materials commonly used for an entertainment production, e.g.	<ul style="list-style-type: none"> <li>• audio equipment</li> <li>• costumes</li> <li>• lighting equipment</li> <li>• props</li> <li>• scenic art</li> <li>• sets</li> </ul>
<b>Transportation</b> may be required	<ul style="list-style-type: none"> <li>• between different venues</li> <li>• by air</li> <li>• by rail</li> <li>• by road</li> <li>• by sea</li> <li>• within a venue</li> </ul>

<b>Packing/loading techniques</b> may include:	<ul style="list-style-type: none"><li>• particular ways of handling different equipment</li><li>• use of protective coverings</li><li>• use of restraints</li></ul>
Packing <b>materials</b> may include	<ul style="list-style-type: none"><li>• boxes</li><li>• bubble wrap</li><li>• bush blankets</li><li>• crates</li><li>• labels</li><li>• road cases</li><li>• rope</li><li>• straps</li><li>• tape</li><li>• tissue paper</li><li>• wardrobe skips</li></ul>
<b>Appropriate personnel</b> may include	<ul style="list-style-type: none"><li>• event/production managers</li><li>• stage managers</li><li>• supervisors/managers</li><li>• technical staff</li></ul>

## Introduction and Assessment

Over the next 17 weeks we will be using several different types of recording devices to record sound sources.

Lecture

What is digital recording [the conversion process from analogue into digital format]

How is the digital information stored [ ]

What are the building blocks of the recording chain [ ]

### Sound source

- Sound capture [microphone direct in]

- Interfaces [cables mixer converters]

- Recording device

- Monitoring [conversion back to analogue]

Types of digital recording devices [show examples]

- Portable

- Hand disk

- Computer

Advantages and disadvantages of each type

- Portable recording devices

### Key features

- Portability

- All in one recordings chain

- Menu driven [explain]

- Import and export capabilities

- Onboard or external microphone

- Build in editing and effects

## Session 3

Overview

Introduction to the Zoom H2 portable recording device.

Lecture

Follow H2 instruction sheet to demonstrate operation of the H2.

### Activity

Students to break into groups and practice using the H2 and headphones to capture some random sounds using the internal microphone. Try using the different microphone pattern.

## Session 4

### Overview

Further practical experience with the Zoom H2 portable recording device.

### Lecture

Review H2 operating procedures and get students to 'teach back' what they learned last week

\*Introduce the use of external microphone

\*Explain how to download audio files to a backup medium

### Activity

Students to break into groups and practice using the H2 and headphones with external microphone to capture some sounds both indoors and outdoors.

Students transfer these to the server using the USB connection.

## Session 5

### Overview

Introduction to Boss 8 track digital recorder

### Lecture

Follow Boss operating instruction sheet to demonstrate operation of the 900CD.

### Activity

Students to break into groups and practice using the Boss and headphones to capture some random sounds using both the internal microphone and the instrument input.

## Session 6

### Overview

External microphone recording with Boss 8 track portable digital recorders.

### Lecture

Explanation as to how to use the external microphone inputs of Boss 900 CD.  
Discussion on microphoning techniques for various situations.

## Assessment : Worksheet: Digital Portable Recorders PART -A

Elements tested: CUSSMLT202A: 1 to 3

### Questions:

1. When using a Zoom H2, are there multiple options for the onboard microphones polar patterns?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
2. If you answered **yes** to the above, how do you change from one pattern to another?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
3. What sort of batteries power the H2?  
\_\_\_\_\_  
\_\_\_\_\_
4. Can you connect an external microphone to the H2?  
\_\_\_\_\_  
\_\_\_\_\_
5. What sort of data (memory) storage device does the H2 use?  
\_\_\_\_\_  
\_\_\_\_\_
6. Can the H2 be connected to a computer via USB?  
\_\_\_\_\_  
\_\_\_\_\_

7. What does the Microphone Gain switch do?

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---

8. What device does the H2 have built in to it to monitor the input level?

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Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

Lecturer: \_\_\_\_\_ Date: \_\_\_\_\_



### Assessment : Worksheet: Digital Portable Recorders PART -B

Elements tested: CUSSMLT202A: 1 to 3

#### Questions:

1. When using a Boss 8 track recorder, is there an internal microphone that you can use?

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2. How many external microphones can you connect to the Boss 900CD?

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3. What sort of data (memory) storage device does the Boss use?

---

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4. How can you upload your recorded data to a computer?

---

---

---

5. What typically might you plug into the **line in** connectionsfi

---

---

---

6. Before you begin recording, what should you adjustfi

---

---

---

7. What do the sliding faders on each channel controlfi

- a. Input level
- b. Playback level
- c. Both of the above

Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

Lecturer: \_\_\_\_\_ Date: \_\_\_\_\_

## Assessment: Direct Observation Checklist: Digital Portable Recorders PART -B

Elements tested: CUSSMLT202A: 1 to 3

### Task:

Digital Portable Recorders Task Guidelines	H2	8 Track
Was the student able to initialise the memory cardfi		
Was the student able to set the recording parameters including turning on microphone and setting gain levelsfi		
Was the student able to successfully record audio onto the memory cardfi		
Was the student able to play back the recorded audiofi		

Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

Lecturer: \_\_\_\_\_ Date: \_\_\_\_\_

## Assessment: Direct Observation Checklist: Digital Portable Recorders

### ASSESSMENT FEEDBACK FORM

Digital Portable Recorders Task Guidelines	H2	8 Track
Was the student able to initialise the memory cardfi		
Was the student able to set the recording parameters including turning on microphone and setting gain levelsfi		
Was the student able to successfully record audio onto the memory cardfi		
Was the student able to play back the recorded audiofi		

## Session 9

### Overview

Expanding capability of Boss Digit 8 track using external mixer and multiple microphones.

#### Lecture

Explain basic structure of unpowered mixers (block diagram).

How to connect the two.

Gain structure.

Monitoring.

Microphone selection and placement.

#### Activity

Students to break into groups and practice using the Boss, external mixer and microphone and headphones to capture some sounds.

## Session 7

### Overview

Explanation microphone recording with Boss 8 track portable digital recorders.

### Lecture

Explanation as to how to use the 2 external microphone inputs of Boss 900CD,  
Discussion on microphoning techniques for various situations.

### Activity

Students to break into groups and practice using the Boss 2 external microphones and headphones to capture some sounds.

## Session 8

### Overview:

The Music Industry - Recorded Sound

### Lecture:

The history of recorded sound

### Early Technology

Initially, devices for capturing and reproducing sound were mechanical, and couldn't be used to record sounds such as the human voice e.g. piano rolls and musical boxes. In 1877 the phonograph was designed - this allowed voices (and music) to be recorded and played back for the first time.

Early recordings of bands were acoustic, and musicians had to crowd around a horn, which picked up the sounds they were making. Attached to the horn was a needle, which physically cut grooves into the recording medium. Sound quality was poor, and performances had to be captured in a single session.

The advent of electrical recording in 1925 (using microphones) dramatically improved recording quality, but most record players were still acoustic - wind up gramophones with clockwork motors.

In one form or another, records were the main medium for playback of commercial recordings for the next 60 years - and they are still used to this day!

## Other formats

Two other types of recording/playback medium are optical (which was used for film) and magnetic.

Magnetic was initially very poor quality, and primarily used for voice, until the first practical tape recorders were produced in the 1940's and 1950's. These eventually led to multi tracking which enabled musicians to record "a piece at a time" by over-dubbing additional parts. Magnetic tape also allowed the engineers to erase, re-record, and edit performances. This technology was the main means of recording music until the 1990's.

Acoustic, electric, optical, magnetic - all these formats are analogue in that they are based on the same principles as human hearing. Sounds begin as physical waveforms in the air, and are transformed into an electrical representation of the waveform, via a microphone, and are stored. To be re-created into sound, the process is reversed, and converted back into physical waveforms through a speaker.

## New technology

Digital audio was first used in the early 1970's - and with improvements in technology, has now become the main medium for recording. The analogue audio signal (eg. someone singing into a microphone) is converted into binary (or computer) information. It can then be manipulated without loss of quality.

Digital audio has emerged because of its usefulness in the recording, manipulation, mass-production, and distribution of sound. Initially CD's (compact discs) were used to distribute recording to the public, but these days, data files (such as mp3) rather than as physical objects (such as CD's or records) have significantly reduced costs of distribution.

## Activity:

Small group exercise:

1. Why is the recording industry important to Australia's culture and economy?
2. What are current Strengths, Weaknesses, Opportunities and Threats (SWOT) for recorded music?
3. How is it advertised?
4. Pay?
5. What is the future of recorded music?

## Session 9

### Overview

Expanding capability of Boss Digit 8 track external mixer and multiple microphones.

#### Lecture

Explain basic structure of unpowered mixer (block diagram).

How to connect the two.

Gain structure.

Monitoring.

Microphone selection and placement.

#### Activity

Students to break into groups and practices using the boss, external mixer and microphone and headphones to capture sounds.

## Session 10

### Overview

Introduction to signal flow in analogue consoles. Differences between in line and split consoles.

#### Lecture

Review structure of analogue mixers (block diagram).

Introduce notion of recording path versus monitoring (return path).

Introduce Aux section.

Introduce EQ section.

## Session 11

### Overview

Introduction to signal flow in audient console; single sound source.

#### Lecture

Getting signal into channel, setting gain, sending to headphones.

#### Activity

Students to practice with a sound source in the live room, getting it through the console and back to the headphones.



## Session 12

### Overview

More practice using audient console, Multiple sound sources.

Lecture

Review last week's lesson.

Activity

Students to practice with a sound source in the live room, getting it through the console and back to the headphones.

## Session 13

### Overview

Introduction to Hd24

Recording from audient console.

Lecture

Run through the features of the Hd24

Explain signal flow out of the desk into the recorder and back to desk.

Activity

Students to practice with a sound source in the live room, getting it through the console and into the Hd24.

### Session 14

#### Overview

Recording from audient console into to Hd24.

#### Activity

Students to set up a band in the live room and record into the Hd24.

### Week 15

#### Overview

Recording from audient console into to Hd24.

#### Activity

Student to set up a band in the live room and record into the Hd24

### Week 16

#### Overview

Recording from audient console into to Hd24.

#### Activity

Student to set up a band in the live room and record into the Hd24

### Week 17

#### Overview

More practice using audient console. Multiple sound sources.

#### Lecture

Review last week's lesson.

#### Activity

Students to practice with a sound source in the live room, getting it through the console and back to the headphones.

## RESOURCES & ASSESSMENT

Sound Production Specialist

CUSSOU201A and CUETGE15B

Sound Production Specialist

Live Class Notes

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## INTRODUCTION

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### *Employment in the Production Industry*

#### **The Production Tree (see below)**

- big scale productions (single role responsibilities)
- smaller scale productions (multiple role responsibilities)

#### **Loaders - The first step**

- examples of local production companies
- what you are required to have (safety boots, gloves, industry card, transport)

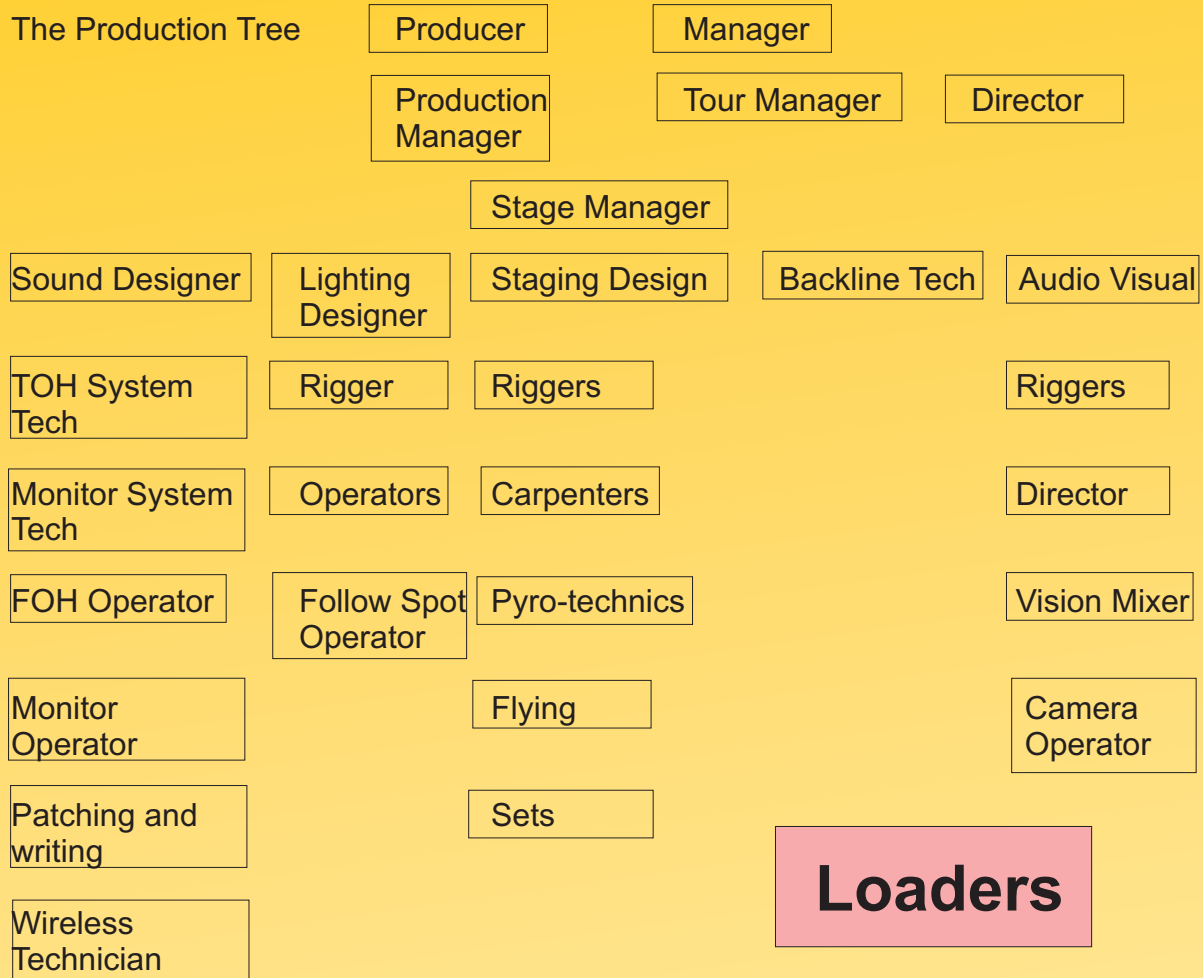
#### **Safety review**

- reporting hazards
- falling, lifting electricity use of RCD's, testing

#### **Noise levels**

- exposure regulations
- protections
- dB scale

Demonstrate various levels through PA using dB meter.



Created by Jason Brown8/11

Central 2011

## Week 3 Class 2: Live Class Notes

### Review last week: OHS

In Brief: Expanded on what was discussed about volume exposure. Examined in more detail hearing protection types.

Discussed appropriate clothing and how to avoid trip hazards etc. The aim next week is to work solely on lifting techniques and practice lift exercises.

Work Safe: A Government body with legal powers to uphold safety laws and prosecute for breaches of the safety law.

Volume = hearing damage = Tinnitus (can also be caused by medication or Malaria).

85 dBSPLa for 8 hrs 3dB increase = half the length of exposure.

100dBSPLa = 15min per day

- reduce exposure
- turn down volume
- hearing protection

**Hearing protection:** 50c - \$250

**Fingers in your ears:** Free, bad frequent response

**Ear muffs:** High protection but affects the sound response as well as volume.

**Foam ear plugs:** \$50c - \$5.00 (cheap, easy to fit, up to 25dB attenuation.

Therefore 100dB = 75dB. Does affect the sound response: Dull and boomy. Can "hear" own voice through bones.

**“Heros”:** \$25 (Look like a Christmas tree) - better response, better fitting.

**Moulded ear plugs:** \$200 plus (great frequent response selectable attenuation -25, -15, -9dB and almost no occlusion effect).

**Emergency ear plugs:** Tissue paper rolled up then folded into a V.

**Clothing:**

**Footware:** Closed toes, good grip for ramps, (steel capped or similar may be required by employer or work site) and also comfortable.

**Close fitting clothing:** To avoid catching on things or tripping. Consider sun protection.

**Hats and sunglasses:** Lots of production work happens outside. Avoid sunburn or heat stroke.

**Sun-cream:** Needs to be reapplied regularly.

**Gloves:** Pig skin or similar. Extra layer of skin to stop cuts, splinters and similar injuries (don't need to be hygienic, chemical proof or heat proof).

**Working at height:** Above 2m need to be correctly trained to use safety gear (harness etc). Technically ladders are no longer useable for working from. They are only for climbing. Need to use work platforms to work off.



### **Tripping:**

#### **Cables can cause trip hazards and obstructions**

These can be covered with:

- carpet strips, or Marley (brand name) rubber style strip: can buckle and cause a trip hazard of its own)
- cable trays: expensive modular system that can be driven over
- Gaffa Tape (brand name): cables can be securely taped down to avoid loops that can cause trip hazards
- Gaffa = \$20 per roll. Pressure tape (more pressure = more sticking power)

### **Drugs and alcohol:**

Illegal is illegal regardless of how famous you are (The Rolling Stones).

More importantly a reputation for working under the influence of either drugs or alcohol will directly limit working opportunities.

A criminal conviction will stop visa permission to USA, Japan and other countries for 10 or more years.

Your choice: Party like there is no tomorrow, but remember tomorrow starts at dawn.

Obvious but important things to remember: Sleep well, eat well, and drink plenty of fluids.

### **Next Week: Lifting smarter not harder**

#### ***Week 4 Class 2: Live Class Notes***

#### ***Using the "live" room as an example***

### **Stage**

Explained down stage / upstage, stage left, stage right

Prompt / opposite prompt

### **Difference between FOH and monitors**

**FOH:** 2 sends (L/R) for audience.

**Monitors:** Many send to individual listeners.

**Microphone signal:** Microphone and clip and stand and microphone lead to splitters - one version to FOH desk, one version goes to monitors.

**What are the sources:** Inputs from stage, fx sounds, cd music/ iPod. Example of gig week input list. This lets you create an **input list**.

**Where people are located:** Amps, drums, power etc.

Lets you create a **stage plot**. For example: gtr 1 upstage, stage right.

**Looms:** Briefly discuss that we can get many signals to one place simply, still need to discuss multi-core.

Looked around both areas and showed them how 32 channels on the Mackie gives you 32 individual preamps, eqs etc and how the sounds are then blended to the mix.

If you understand how one channel works, then you know how they all work and the sounds are just different on each channel and blended together like a cocktail or soup.

Give a brief comparison of the analogue FOH vs D-show digital system.

Finished off discussing impressions of the performance.

### **Week 5 Class 2: Live Class Notes**

#### ***Lifting techniques***

#### **Quickly explain the way the spine works**

Spinal cord fits through vertebrae. Any alteration to its path causes muscle pain / strain and affects the nerve impulses to organs and muscles.

Everyone knows you should lift with a straight back and use your legs. Other things need to be considered too.

#### **Lift evenly**

**Exercise 1:** In Pairs: Get the students to stand on level ground and with legs spaced evenly and hold their arms out horizontally beside them. Like a star jump.

The other student of each pair tries to push their arms down (note the force needed to move the arms and the strength available to resist).

Now place a small item under one foot (I used some of the free demonstration cds).

And repeat the exercise. Off setting the balance, even slightly, reduces the strength available to resist the down force.

It will be impossible to always lift on even ground

Point out that lifting an object to one side will cause your body to have to bend the other way to counter-balance the weight. This reduces the strength available for lifting.

**Sometimes it's better to lift two things, one either side, as you can stay straight / stronger.**

**Keep the weight close to your body.**

**Exercise 2:** Standing up, legs spaced evenly, hold arms out in front of your body, horizontally. See how long it takes to feel strain. Where does it hurt?

Now pick up a chair and hold it at arms length (Warning: can cause back strain).

Compare the weight to holding the chair against your body (much easier).

### **Keep the item above you waist**

Keeping the weight above your waist will allow you to maximise your mobility. Your legs are not obstructed by the object.

### **Too heavy**

When too heavy the safe way is to wait for assistance. (Better to wait than drop a person or break equipment).

Most work places say 20Kg is maximum weight for one worker to lift.

### **Share a lift**

When lifting with others communication is the key. For example, you could say "This item is going over there and we are going to lift it this way and put it down on this surface. Ready 1, 2, 3".

A lack of communication means 2 people can work against each other.

Discuss which way people should face. I don't agree with people carrying loads behind their back so that they can see where they are going because the load is now pulling behind them.

If the person at the back slows or stops the front person will be pulled back or have the load pulled out of their hands.

Best case is they walk sideways. If someone is going backwards it gets back to communicating directions clearly.

### **Obstacles: When carrying things your vision is obstructed**

Obstacles can be: edges (stage edges) debris (bottle, can, rubbish).

People / children (sometimes you need a person to clear the way through people).

Cables (trip hazards).

Doorways and narrow passages (always keep hands inside the item to avoid your hand being jammed between door frame and item).

Stairs: Stairs are dangerous. Hard to see steps.

When stairs start or finish the person on the flat will travel away faster than the person who is still on the stairs. It's important that the person on the flat slows down to maintain distance between lifters.

The lower person should also lift the item higher to stop the person above needing to stoop (reducing their ability to lift).

**Exercise 3:** In pairs carry a table out of the venue (through the doorway) up the stairs and back down the stairs.

**Point out that a table upside down removes the obstacle of the legs affecting walking.**

**Students will need to communicate with each other to avoid table legs hitting the bulk-heads above the staircase.**

### **Wheels**

Wheels let us carry or move heavy objects easily. Trolleys, or in-built wheels both work.

Problem with wheels is obstacles (cables on the ground) can tip over a trolley for example and the items being carried.

Example AMP Rack: Amp racks have a heavy end and a light end in order to load the racks.

Which end should go first? Always lift the light end. If the heavy end is first and stops, the item it can easily tip over.

Ramps create the same problem - light end first going up and down to avoid tipping.

### **Lifting above your body**

When lifting items high onto something you can lift the whole item (hard work) **or keep the back-end down and only lift the front edge onto the surface.** This gives you a pivot point to rotate the item up. Easy work.

**Demonstrated lifting** the wheeled road case onto the stage:

Hard Way: Both pick up the whole thing.

Easy Way: Lift front edge higher and once on the surface pivot the rest onto the surface.

The practical exercise with the desk is part of the students' practical assessment.

## Week 6: Class Notes:

### **Cables and connectors**

A circuit needs 2 conductors to complete a circuit (minimum).

#### **Example battery and light bulb**

Type of cable and conductor must match the device ins and outs and signal.

The device decides on which connectors you can use.

The type of signal decides what kind of cable you can use.

Thickness of copper is important. More wire thickness = less resistance.

Two families of cables used:

Transmission - voltage is at maximum and getting from one device to another (power or speaker cable).

Signal - Signal leads carry audio signal and involves amplification. Microphone level to line level etc.

Signal cables need to be shielded from outside noise or interference so as not to amplify noise and signal.

Shielding works like a Faraday's cage.

#### **Demonstration: Speaker cable versus guitar instrument cable.**

Look identical, connectors are the same. Only difference is one has no way to stop interference reaching the conductors.

Shielded cable can be balanced or unbalanced.

Balanced cable is needed to match the devices input and output.

Balanced equipment improves the noise levels by cancelling anything that gets past the shield.

### **Connectors**

- Example of TS TRS XLR RCS SPEAKON.
- Unbalanced have 2 conductors ie RCA or TS jack.
- Balanced must have three ie XLR.
- Looms / stage boxes / multi-cores.
- Looms are just multiple versions held inside one outer sheath.
- Save insulation and thickness.
- Speed up working (less trips while running cables).
- Easier to handle.
- Fewer trip hazards.

#### **Example: Cable off cuts**

Winding techniques.

Cables can develop a memory. Constructed with a clockwise twist.

Loops too big - twist. Loops too small - slinky memory.

Over - Over (can give cable a memory).

Over - Under (can cause knots) needed for looms.

Figure of 8 - freely unwinds and has benefits for power cable excess.

Demonstrate and practice over - over and over - under methods.

## **Week 7: Class Notes:**

### ***Cables and Connectors***

All types of stands: for music or for instruments: guitar, cymbal, microphone and speaker.

You need as many stands as microphones and clips to match (unless clip-on microphones).

**Any stand must be capable of taking the weight.**

**The higher or heavier the load the more unstable.**

**Stability comes from:**

- spreading tripod legs but now also larger trip hazard
- adding weight to base of stand (sand bags)

**Stands use adjustable screws / bolts to tighten and hold their position. Over tightening can easily break the clamp.**

**When adjusting a stand you should only need to loosen, adjust and retighten.**

If you don't loosen before moving, you will eventually wear out the clamp arrangement and the stand will slip.

### **Speaker stands:**

Average load around 25 - 40KG depending on design.

Standard size - 35mm pole fits stand speaker socket.

Weight of speaker box is taken by steel pin through pole holes not the clamp.

Pin is often lost!

Some more expensive stands use a pulley system. This must be locked when at the correct height.

**Speaker Stand**





### Practice:

In groups set up a speaker stand and mount a speaker on it.

You will need 2 people to place the speaker onto the pole.

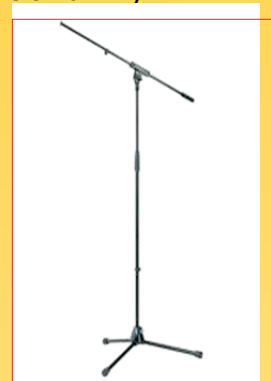
Question: Does it matter what the height of the speaker box is and why?

### Microphone stands

Boom stands are a straight stand with a matching extension arm attached.

The tripod base isolates the microphone from vibrations.

It is really important to make sure the centre pole doesn't touch the ground. This will cause vibration and rumble to get into the microphone.



When setting up a stand, begin at the bottom and check all the thumb screws are tight. The stand and boom should not swivel just because it's loose. This will not hold the microphone in a correct position.

The microphone clip is attached to 2 sizes of thread.

5/8" or 3/8" (a big one or a small one) we tend to use 5/8" in Australia.

Can use thread adaptors to change from one to the other.

### Important

When attaching a clip to a stand, hold the clip to the stand's thread and turn the shaft of the stand, not the clip.

This is easier to get started, uses less effort and doesn't cause the cable to wrap around the stand. Microphone cable shouldn't be wrapped around the stand like a candy cane. Wrapped around gives the microphone cable a memory, can make it hard to adjust the height of the stand, as the cable chokes its movement and makes it very hard to get a microphone off a stand if needed.

### Practice:

Get a stand each. Set up the stand so it is level and stable. Note how little force is needed to stop the sections moving. Over tightening can be damaging!

Attach a cable to the stand so it runs down the stand neatly and has a neat coil at the bottom. If time remains revisit cable winding. Revisit over / over and over /under winding practice. Over - over can give cable a memory but no knot. Over - under ( can cause knots ) needed for looms.

Figure of 8 freely unwinds and has benefits for power cable excess.

**Demonstrate and practice over - over and over - under methods**

### Assessment: OHS Observation Checklist: Safe Lifting

#### Task:

Students are to demonstrate their ability to perform safe lifting techniques. It must be noted that students will interpret the task in different ways and will be observed by their Lecturer.

Task	Yes/No	Comments
The student to demonstrate an understanding of the principle and detail of specified load limits.		
The student to demonstrate a theoretical understanding of the steps involved in performing a safe lift.		
The student to demonstrate the ability to perform the lift following the correct procedures.		
The student to demonstrate the ability to perform a group lift, using effective communication with the other member(s) of the lifting team.		
The student to demonstrate the ability to install or position physical elements according to directionsfi		
The student to demonstrate the ability to load equipment for safe transportfi		

Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

Lecturer: \_\_\_\_\_ Date: \_\_\_\_\_



### OHS Observation Checklist: Safe Lifting Assessment Feedback Form

Elements Tested : BSBWOR203A : 1 to 3  
CUETGE15B : 1 to 3

### OHS Observation Checklist: Lifting

Students are to demonstrate their ability to perform safe lifting techniques. It must be noted that students will interpret the task in different ways and will be observed by their Lecture.

Safe Lifting Feedback Form	Yes/No	Comments
Did the student understand the principle and detail of specified load limitsfi		
Did the students demonstrate a theoretical understanding of the steps involved in performing a safe liftfi		
Was the student able to perform a group lift, using effective communication with the other members(s) of the lifting teamfi		
Was the student able to install or position physical elements according to directionsfi		
Was the student able to load equipment for safe transportfi		

## Assessment : Worksheet 2: Portfolio Digital Recorders Boss 8 Track

Elements Tested	: BSBWOR203A : 1 to 3 CUSOU201A : 1 to 2 CUETGE15B : 1 to 3
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Task:

Students are required to demonstrate their ability to use the basic features of the Zoom H2 and Boss Track 8 portable digital recording devices.

Task Guidelines	Yes/No	Comments
The student to demonstrate the ability to initialize the memory card.		
The student to demonstrate the ability to select all the recording parametersfi		
The student to demonstrate understanding of the onboard microphone optionsfi		
The student to demonstrate the ability to record to a track and play it backfi		
The student to demonstrate the ability to set up all the hardware connections as required.		
The student to demonstrate the ability to activate the required microphone successfully.		
The student to demonstrate the ability to record one track, play it back and record on a second track.		
The student to demonstrate the ability to play back the finished recordingfi		

Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

Lecturer: \_\_\_\_\_ Date: \_\_\_\_\_

## Observation Checklist: Zoom H2 & Boss 8 Track ASSESSMENT FEEDBACK FORM

Elements Tested : BSBWOR203A : 1 to 3  
CUSOU201A : 1 to 2  
CUETGE15B : 3

**Assessment :**

**Observation Checklist Zoom H2 and Boss 8 Track**

Zoom H2 and Boss 8 Track Feedback Form	Yes/No	Comments
Did the student initialize the memory cardfi		
Was the student able to select all the recording parametersfi		
Did the student demonstrate understanding of the onboard microphone optionsfi		
Was the student able to record to a track and play it backfi		
Did the student set up all the hardware connections as requiredfi		
Did the student activate the required microphone successfullyfi		
Was the student able to record one track, play it back and record on a second trackfi		
Was the student able to play back the finished recordingfi		

## **Week 11 Class 2: Live Class Notes**

***DI sources (keyboards acoustic GTRs, CD players)***

### **Objective:**

**To explain the uses and functions of DI boxes.**

**Microphones “hear” air vibrations and convert them into signal voltage.**

**Anything that makes a noise can be converted into a signal voltage for amplifying and mixing.**

**Some sound sources already generate the signal voltage:**

- electric guitar pickups
- bass guitar pickups
- acoustic guitars
- keyboards
- samplers
- CD players
- electronic drum kits

**These signals are high level (line level) and hi impedance (resistance / pressure).**

A DI converts Hi Z (impedance) Hi level, unbalanced signals to Low Z, microphone level and balanced signals. This allows the signal to be correctly connected into the audio signal chain.

Hi impedance signals are dramatically affected by the length of cable the signal must pass through. Low impedance signals are not. Hi Z signals can go metres, low Z can go 100's of metres without the sound being changed by the length of cable.

Microphone level signals are balanced signals and can run phantom power.

DI's are either passive or active.

Passive just converts the signal (they require more pre amp gain for the signal).

Active uses an amplified circuit (this produces a louder signal).

Active need batteries or phantom power (sent down the balanced microphone cable).

What are the inputs for? 2 jack inputs let you plug into the DI and link out to the amplifier. The DI steals a copy of the signal but doesn't affect the signal getting to the amplifier.

### **Pads**

Attenuators reduce the input level to fit the signal into the circuit, just like on the H2 recorders. Great for getting a DJ mixer output (high level signal) down to microphone level so it can be sent from the stage to the FOH desk and then mixed back into the PA.

### **Earth lifts:**

Brief earth loops explanation. Earth loops can safely be broken by lifting the audio ground, not the earth safety pin

### **Conclusion:**

DI boxes allow us to interface one type of level and “pressure” output from a device with the correct input, level and “pressure” for another type of device in the signal chain.

- convert signals so we can send them long distances
- interface with balanced cables and connectors
- drop hi level signals to low level signals

## **Week 12 Class 2: Live Class Notes**

### **Amplifiers: What are they?**

Take energy from a power supply to increase the output to input ratio. Essentially it is matching the input waveshape but with a bigger amplitude. There may be several amps in a signal chain (eg pre, power etc).

### **Valves:**

- how valves work
- care of valves
- output load requirements (impedance)

### **Solid state:**

- shorting of outputs
- modelling amps

### **Hybrid amps:**

- combination

### **Combos versus component:**

- tone circuits
- effects loops
- signal flow
- reverb units

## Week 13 Class 2: Live Class Notes

### ***Vocal microphones: Gain before feedback and stage placement***

#### **Objective:**

Demonstrate the basic methods for increasing signal level and sound isolation without feedback.

1. Briefly review common microphone:
  - a) Transducers - dynamic, condenser, ribbon, piezo (contact pick up).
  - b) Pickup patterns - cardioids, (super, hyper) , Omni , Figure 8.

Demonstrate the torch example. Different microphones are like different torch patterns and intensity.

Bubble theory - increasing the level or gain of a microphone is like expanding the size of the polar pattern. The more gain the larger the bubble is.

The output of the speaker or source also creates a bubble of size that depends on how loud the sound is.

2. What causes feedback? If the sound source can hear its own output then it will amplify its self in an ever increasing level. If the bubble from the microphone overlaps with the speaker bubble then it will be able to hear itself.

Note: Feedback will occur at the first frequency to be heard by the loop and that frequency or note will increase rapidly.

3. Discuss why live sound uses cardioid patterns to increase sound source and avoid others - hears one side of the microphone better than the other.
4. Briefly explain the inverse square law. If you measure the level of a sound and then measure it at double the distance, the intensity of a sound is  $\frac{1}{4}$  of the first reading. Sound level drops over distance then demonstrate the 4 M's with a microphone and speaker system.
  - a) Maximise the sound source level: By increasing the sound source (a bigger sound bubble source) the microphone doesn't require as much amplification and will have less unwanted sounds in the microphone and a smaller pickup bubble.
  - b) Minimise the distance from the sound source to the microphone (minimise loss over distance from the source. Reduce the size of the microphone pickup bubble).
  - c) Minimise the distance from the speaker to the listener (the speaker bubble can be smaller as there is less loss over the distance to the listener. This reduces the chance of the bubbles overlapping).
  - d) Maximise the distance from the microphone to the speaker (reduce the chance of the bubbles overlapping).



The 4 M's deal with how sound level changes over distance. The big question is with monitors. Which is more important C or Dfi Answer is C. It is more important to have the speaker as close to the listener as possible as it means the speaker bubble can be smaller which can be avoided by the rear of a cardioid polar pattern.

1. Ball cupping: Demonstrate how bad microphone technique can reduce the polar pattern of the microphone, change the sound the microphone picks up (more honk and middle) and miss the microphones altogether. ie keyboard player who sets the microphone position for looking at the audience but then lowers their head when they play and miss the microphone's pickup pattern.
2. Spill and isolation: Now consider the way sounds radiate on stage. It is important to place you amplifiers to radiate the sounds in the right directions.
  - a) Place the amp on a crate or table to bring it closer to the listener.
  - b) Angle it so you can hear all of the on axis sound coming from speaker. (We lose high frequency information as it is able to be pointed).
  - c) Point the amps on stage so others can hear it or away from others who don't when possible. For example: Amps across the stage rather than out into the audience.
  - d) Set the drummer in front of the backline so they can hear the amps as well. (This will increase the sounds from the amps spilling into the drum microphones though).

### **Conclusion:**

We should now be able to “see” how sounds spread out from speakers (like a sprinkler) and how microphones pickup the sounds (like a torch).

We can improve or ruin the sound on stage and therefore the overall sound simply by placing our equipment in the wrong spot or by placing our microphone in the wrong direction.

### **Week 14: PA Lesson**

**Power Draw - single phase / 3 phase / earth loops.**

**A real basic idea of current draw and power distribution.**

**Review gain structure.**

**Microphone level (pre amp) line level (power amp) speaker level.**

The process and steps are common to all system but some may have the power amp built into the desk and others will have the power amp built into the speaker box.

**A powered speaker and a powered desk both have a power amp built into the unit to raise the signal to speaker level to move the speaker.**

**Question: What type of signal level does a powered speaker want at the input?**

**Can I put a powered mixer into a powered speaker?**

Common to all arrangements: The gain steps.

### **Current draw**

**Australian Power 240V @ 50Hz US Power 110 @ 60Hz**

But how many things can I power from one outlet. Total demand versus total available.

Power = Volts x Current flow so for US power to equal Aust Power, higher volts means low current flow.

Us power cables are twice as thick as Australian ones to accommodate current flow.

For Example: 1000w light at full power draws.

$$1000W = 240 \times \text{Current.}$$

$$1000 / 240 = \text{Current.}$$

4 Amps current draw for a 1000W light.

**Australian GPO (general purpose outlet) has a 10 AMP total current available.**

**How many 1000w lights can I use on one 10Amp circuit?**

Imagine the xbox, heater, flood lights drawing current and then someone turns on the kettle. You can only draw the total available. Over drawing will cause failure of a breaker or fuse to stop further damage. (Heat = Fire).

**Show examples of powered breaker (heat trip due to too much current draw versus fuse wire).**

**Question, how do we get more power? The bigger the engine the more current available.**

**Single phase versus 3 phase.**

**32 Amp 3 phase = 96Amps total we spread that out amongst our demand.**

**Higher current flow = thicker cables to allow the current to flow without resistance.**

### **Ground loops**

Where we get our power from is important. We need to keep all the audio equipment on the same phase to avoid different lengths of wire to earth. If a ground loop exists we can hear it.

We can stop it by breaking the power earth (dangerous) disconnecting the circuit (no sound) or lifting the earth from the audio circuit (pin 1 lift, and lift).

### **Example**

Bass head DI out to mixer input both powered from different circuits gives a great earth loop. DI out has lift switch. Lift switch will make things better or worse but keep electrical earth safe.

Note: Repeat the activity with Indian Power use in mind.



Additional Resources

Small PA Systems PowerPoint

## INTRODUCTION

- ✎ home studio monitoring
- ✎ live solo and duo acts
- ✎ public announcing

### Basic system equipment:

- ✎ mixing desk with microphone input
- ✎ microphone and microphone cable
- ✎ self-powered speakers and speaker leads

### Setting-up Equipment



### Power on procedure

- ✎ connect in all cables
- ✎ turn on mixing desk
- ✎ turn on speakers

### Power off procedure

- ✎ turn off speakers
- ✎ turn off mixing desk
- ✎ disconnect all cables

## Medium PA Systems PowerPoint

### Medium size PA Systems



## INTRODUCTION

- ✎ small bands
- ✎ live solo and duo acts (medium sized venues)
- ✎ public announcing

## Basic system equipment

- ✎ mixing desk with multiple microphone inputs
- ✎ microphones and microphone cables
- ✎ effects units (reverb, delay etc)
- ✎ full range speakers for FOH
- ✎ power amplifier
- ✎ self powered monitor speaker

## Microphones

- ✎ types
- ✎ phantom power
- ✎ connections

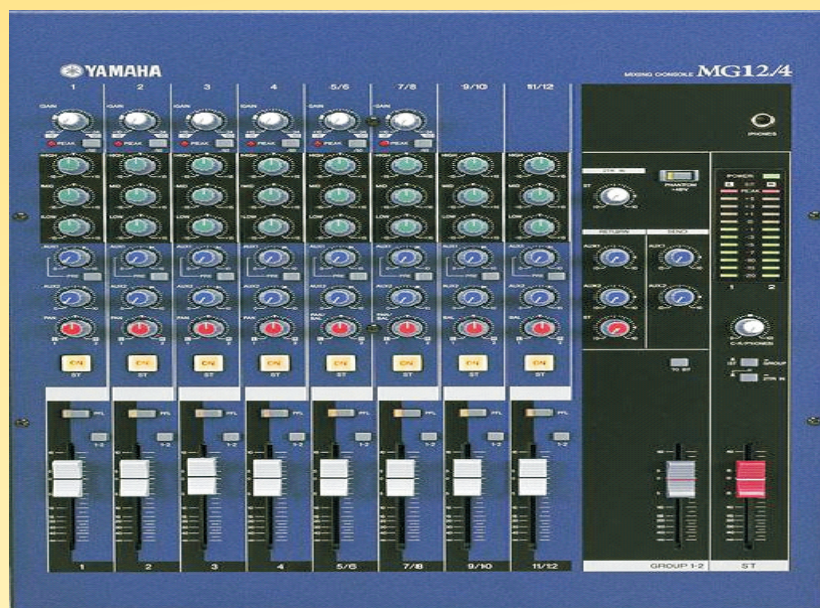


## Mixing Console:

### Signal flow Channel strips

- ✎ input gain
- ✎ EQ
- ✎ AUX sends

### Live verses recording











## Setting-up Equipment







### POWER ON PROCEDURE







-  connect in all cables including microphones and DI's, effects sends, speaker cables etc
-  turn on mixing desk
-  turn on power amplifier
-  turn volumes up on amplifier
-  turn on monitor/foldback speaker
-  set signal levels by following the usual procedure

**Note:** Always make sure that all the faders on the mixing desk are all the way down until everything is switched on and the amps are turned up.

### Level setting procedure



-  Ensure all gain and output faders are completely off.
-  Create a real world level.
-  Press the channels solo button.
-  Adjust gain until the meter hits the 0 mark.

### POWER OFF PROCEDURE:

-  turn volume down on amplifier  
**Do not turn power off at this stage.**
-  turn faders down on mixing desk as well as gain knobs, aux sends, group sends
-  turn off monitor speaker
-  pack up microphones and cables
-  turn off power amp, then mixing desk, then all other devices
-  disconnect all cables

### Occupational Health and Safety

#### For your safety

-  use correct lifting techniques and
-  protect your ears

## Assessment : System Setup

Elements tested: BSBWOR203A: 1 to 3  
CUSSOU201A: 1 & 2

### Questions:

Use your existing knowledge or conduct research to complete the following worksheet.

1. What is the name for the type of connecting plugs on a balanced microphone lead?

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2. What is **foldback** for, in a live situation?

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3. What does **front of house** sound mean?

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4. What instruments might use a DI box?

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5. One of the most commonly used microphones in a live situation is a Shure SM58. What is it mainly used for?

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6. When working with amplifiers (e.g. guitar amps or PAs in rehearsal rooms) what **must** you do before plugging in or disconnecting a leadfi

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7. What converts sound into electrical energyfi

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8. What is the purpose of a **crossover**?

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9. What is the difference between an **active** and a **passive** speaker boxfi

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10. If you were given the following components to connect together in a PA system, what order would you place them in fi

Mixer \_\_\_\_\_

Amplifiers \_\_\_\_\_

Microphones \_\_\_\_\_

EQ unit \_\_\_\_\_

Speakers \_\_\_\_\_

Crossover \_\_\_\_\_

11. Describe the difference between amplitude and frequency:

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12. What is considered to be the normal frequency range of human hearing?

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13. What units of measurement are used to measure:

a. Sound pressure \_\_\_\_\_

b. Frequency \_\_\_\_\_

14. In audio terms, what is feedback, and why is it undesirable?

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Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

Lecturer: \_\_\_\_\_ Date: \_\_\_\_\_

## Assessment: Live Sound Recording

Elements Tested : BSBWOR203A: 2  
CUETGE15B: 1 to 3

**Time Allowed:** 1 Hour

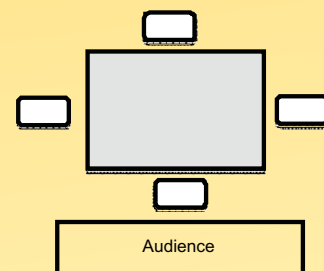
### Instructions:

1. Multiple Choice
2. Open book assessment
3. Individual assessment

### Questions:

1. In Australia, what is the suggested average sound pressure level (dB SPL<sub>A</sub>) you can listen to safely for 8hours a day without damaging your hearingfi
  - a. 65dB SPL<sub>A</sub>
  - b. 85dB SPL<sub>A</sub>
  - c. 95db SPL<sub>A</sub>
  - d. 100dB SPL<sub>A</sub>
2. Circle all possible ways to reduce hearing damage:
  - a. Ear plugs
  - b. Reduce exposure
  - c. Wearing sunglasses
  - d. Reducing the volume
3. Which is **not** going to improve your safety while workingfi
  - a. Loose fitting clothes
  - b. Sunglasses
  - c. Gloves
  - d. Steel cap shoes
4. When lifting objects you should avoid:
  - a. Keeping your back straight
  - b. Lifting with your legs
  - c. Twisting and turning
5. When lifting with others it's important to:
  - a. Be the same height
  - b. Communicate
  - c. Count to three
6. With oversized objects:
  - a. It's smart work to ask for help
  - b. As long as it's in a road case you can't damage it
  - c. If it isn't dropped then the load in can be done quicker
7. When transporting equipment in a vehicle it is important to:
  - a. Stack everything as high as possible
  - b. Fit everything in
  - c. Make sure everything is secured so nothing can move if having to stop quickly.
8. When running cables you should:
  - a. Use the longest cables available
  - b. Leave the extra cable all in the same place
  - c. Tape down or cover all cables that could be a trip hazard

9. The multi-core is used to:
- Power the speakers
  - Send multiple individual signals from one location to another easily
  - Control the lighting
10. Which cable winding method can cause regular knots when unwound:
- Over and over
  - Over and under
  - Figure 8
11. A Cross-over:
- Overlaps two signals
  - Divides an audio signal into a number of frequency bands (high, mid, low)
  - Adds reverb to the signal
12. Which speaker system requires more amplifiers?
- Passive speaker system
  - Active speaker system
13. Speakers should be placed:
- Behind the microphones
  - Pointing at the front of a microphone
  - As low as possible
  - In front of the microphones
14. If a speaker box has a coverage pattern of 60 x 40, what frequency range can it control?
- Subs
  - Low
  - Mids
  - Highs
15. Backline is:
- The guitar amplifiers, speakers, keyboards and drum kits needed to perform
  - The last row of seats
  - Microphones, mixing desks and cables
16. Name the parts of the stage:
- Downstage
  - Upstage
  - Stage left
  - Stage right



Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

Lecturer: \_\_\_\_\_ Date: \_\_\_\_\_

## Assessment: Studio Basics

**Elements Tested : BSBWOR203A: 2  
CUETGE15B: 1 to 3**

### Task:

Students are required to demonstrate their ability to set up a microphone to capture a sound source and use the basic features of a mixing console to route that signal to the control monitors and performers' headphone.

Task Guidelines	Yes/No	Comments
The student to demonstrate the ability to set the microphone up correctly.		
The student to demonstrate the ability to set the correct gain structure.		
The student to demonstrate the ability to route the signal to the control room monitors.		
The student to demonstrate the ability to route the signal to the tracking room headphones.		

Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

Lecturer: \_\_\_\_\_ Date: \_\_\_\_\_

## Assessment: Studio Basics

### Assessment Feedback Form

Elements tested: BSBWOR203A: 1 to 3  
CUSSOU201A: 1 & 3

#### Direct Observation Checklist

Studio Basics Feedback Form	Yes/No	Comments
Did the student set the microphone up correctlyfi		
Was the student able to set the correct gain structurefi		
Was the student able to route the signal to the control room monitorsfi		
Was the student able to route the signal to the tracking room headphonesfi		

## Section 4: Sound Production Specialists

### Assessment : System Setup

#### MARKING KEY

#### Marking Key:

1. What is the name for the type of connecting plugs on a balanced microphone lead?

XLR

2. What is **feedback** for, in a live situation?

So the performers can hear themselves on stage

3. What does Front of House sound mean?

The sound that the audience hears

4. What instruments might use a DI box?

Keyboards, acoustic guitar, bass

One of the most commonly used microphones in a live situation is a Shure SM58. What is it mainly used for?

Vocals

5. When working with amplifiers (eg. guitar amps or PAs in rehearsal rooms) what **must** you do before plugging in or disconnecting a lead?

Turn down the volume or turn off the amp

6. What converts sound into electrical energy?

A transducer (microphone)

7. What is the purpose of a **crossover**?

To split the audio signal into separate frequency bands

8. What is the difference between an **active** and a **passive** speaker box?

9. If you were given the following components to connect together in a PA system, what order would you place them in

Mixer	2
Amplifiers	5
Microphones	1
EQ unit	3
Speakers	6
Crossover	4

10. Describe the difference between amplitude and frequency:  
Amplitude relates to the volume of a sound, frequency is the pitch

11. What is considered to be the normal frequency range of human hearing?  
20 - 20KHz

12. What units of measurement are used to measure:

a. Sound pressure  
Decibels

b. Frequency  
Hertz

13. In audio terms, what is feedback, and why is it undesirable?

Feedback occurs when a sound loop exists between an audio input (for example, a microphone or guitar pickup) and an audio output (for example, a loudspeaker). It is undesirable because it can damage both hearing and equipment if uncontrolled.



## Assessment : Live Sound Recording Marking Key

Elements tested: BSBWOR203A: 2  
CUETGE15B: 1 to 3

### Marking Key:

#### Questions:

1. In Australia, what is the suggested average sound pressure level (dB SPL<sub>A</sub>) you can listen to safely for 8hrs per day without damaging your hearingfi
  - a. 65dB SPL<sub>A</sub>
  - b. 85dB SPL<sub>A</sub>**
  - c. 95db SPL<sub>A</sub>
  - d. 100dB SPL<sub>A</sub>
2. Circle all possible ways to reduce hearing damage:
  - a. Ear plugs
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  - c. Wearing sunglasses**
  - d. Reducing the volume
3. Which is **not** going to improve your safety while workingfi
  - a. Loose fitting clothes**
  - b. Sunglasses
  - c. Gloves
  - d. Steel cap shoes
4. When lifting objects you should avoid:
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  - c. Twisting and turning**
5. When lifting with others it's important to:
  - a. Be the same height
  - b. Communicate**
  - c. Count to 3
6. With oversized objects
  - a. It's smart work to ask for help**
  - b. As long as it's in a road case you can't damage it
  - c. If it isn't dropped then the load in can be done quicker.
7. When transporting equipment in a vehicle it is important to:
  - a. Stack everything as high as possible
  - b. Fit everything in
  - c. Make sure everything is secured so nothing can move if having to stop quickly.**
8. When running cables you should:
  - a. Use the longest cables available
  - b. Leave the extra cable all in the same place
  - c. Tape down or cover all cables that could be a trip hazard**

9. **The multi-core is used to:**  
a. Power the speakers  
**b. Send multiple individual signals from one location to another easily**  
c. Control the lighting
10. **Which cable winding method can cause regular knots when unwound?**  
a. Over and over  
**b. Over and under**  
c. Figure 8
11. **A Cross-over:**  
a. Overlaps two signals  
**b. Divides an audio signal into a number of frequency bands (High, Mid, Low)**  
c. Adds reverb to the signal
12. **Which speaker system requires more amplifiers?**  
a. Passive speaker system  
**b. Active speaker system**
13. Speakers should be placed:  
a. Behind the microphones  
b. Pointing at the front of a microphone  
c. As low as possible  
**d. In front of the microphones**
14. If a speaker box has a coverage pattern of 60 x 40, what frequency range can it control?  
a. Subs  
b. Low  
c. Mids  
**d. Highs**
15. Backline is:  
**a. The guitar amplifiers, speakers, keyboards and drum kits needed to perform**  
b. The last row of seats  
c. Microphones, mixing desks and cables

16. Name the parts of the stage:

- a. Downstage  
b. Upstage  
c. Stage left  
d. Stage right

