## 1. Module details

**Module name**

# VCR Basic Principles

**Module duration**

It is expected that students with the appropriate entry knowledge and skills will successfully complete this module in 36 - 40 hours.

**Module code**

NUE802

**Discipline code**

0703230

## 2. Module purpose

This module provides the student with a simple overview of the VHS video recording system together with the knowledge and skills to safely carry out the installation of a VCR and to perform basic mechanical servicing.

## 3. Prerequisites

NUE101 Introduction to TV.

## 4. Relationship to competency standards

This module provides some of the knowledge and skills underpinning competence in the following standards: Metals and Engineering Industry National Competency Standards, Units 18.45A, 18.56A, 18.65A. National Electrotechnology Industry Standards, Units NES205, NES302, NES303, NES305, NES306, NES402, NES403, NES406, NES407.

## 5. Content

**VCR installation**
Typical installation methods
Cables and connectors
VCR operation
VCR specification

**Magnetic recording techniques**
Magnetic recording principles
Specifications, limitations and terminology
Audio recording principles
Block diagram of simple audio recording process

**Helical scanning principles**
Need for helical scanning
Head and tape speeds
Two head recording
Zero guard band principles
Azimuth recording
Requirement for head switching
Head drum assembly
VHS tape format and specifications

**VHS mechanical systems**
Tools and equipment required for mechanical service
Basic mechanical system layout
Tape transport system
Mechanical maintenance
Mechanical adjustments
Mechanical component replacement
Safety

**FM recording principles**
Review of FM principles
Requirements for FM recording
Basic block diagram of luminance processing

**VHS electronic system overview**
Block diagram
E-E modes
System and servo control
Colour under-recording

## 6. Assessment strategy

**Assessment methods**

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

**Conditions of assessment**

Normally learning and assessment will take place in a classroom / laboratory environment.

## 7. Learning outcome details

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| **Learning outcome 1** | **Demonstrate the correct procedure to install and operate a VCR.** | |
| **Assessment criteria** | 1.1 | Demonstrate the correct method of installing a typical VCR with a TV receiver or monitor including correct VCR and TV tuning to local channels. |
| | 1.2 | Demonstrate the correct operation and understanding of the VCR customer controls. |
| | 1.3 | Demonstrate the correct method of connecting two VCR machines and one television for the purpose of editing video tapes. |
| | 1.4 | Describe the manufacturer's specifications of a given VCR. |
| **Learning outcome 2** | **Describe the techniques used in magnetic tape recording.** | |
| **Assessment criteria** | 2.1 | Describe the principles of magnetic recording. |
| | 2.2 | Describe and interpret the specifications associated with magnetic tape recording. |
| | 2.3 | Describe audio recording principles. |
| | 2.4 | Draw a block diagram of a simple audio recording process. |
| **Learning outcome 3** | **Describe the helical scanning process and FM magnetic recording principles as used in a VHS VCR.** | |
| **Assessment criteria** | 3.1 | Draw the VHS tape format and list the specifications relating to VHS tape recording. |
| | 3.2 | Describe FM magnetic recording principles. |
| | 3.3 | Describe the need for using helical scanning principles. |
| | 3.4 | Describe the zero guard band system and the need for a two head azimuth recording system. |
| | 3.5 | Describe the requirement for head switching. |

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| **Learning outcome 4** | **Demonstrate the knowledge and skills necessary to maintain, adjust and replace components within the mechanical section of a VHS VCR, using safe working practices.** |
| **Assessment criteria** | 4.1 Locate and identify the fundamental components of the mechanical section of a typical VCR. |
| | 4.2 List the tools and equipment required to carry out mechanical servicing. |
| | 4.3 List the mechanical adjustments available and describe their purpose. |
| | 4.4 Demonstrate a full tape path alignment. |
| | 4.5 Describe a typical maintenance schedule for a VCR. |
| | 4.6 Demonstrate a typical maintenance procedure for a VCR service. |
| | 4.7 Locate identify and replace defective components within the VCR mechanism. |
| | 4.8 Demonstrate appropriate testing and checking procedures of the VCR after mechanical service. |
| | 4.9 Explain the terms compatibility, back tension, take up reel torque, azimuth, zenith and longitudinal adjustments. |
| | 4.10 Demonstrate the skills necessary to measure the FM signal and envelope using an oscilloscope. |
| | 4.11 Demonstrate safe working practices. |

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| **Learning outcome 5** | **Describe the luminance signal processing stages within a VHS VCR.** |
| **Assessment criteria** | 5.1 Draw a block diagram of a luminance FM recording process.<br><br>5.2 Describe the function of each block within the recording process and the effect that each block has on the video waveform.<br><br>5.3 Draw a simple block diagram of a luminance FM playback process.<br><br>5.4 Describe the function of each block within the playback process and the effect that each block has on the video waveform. |
| **Learning outcome 6** | **Describe the operational principles of the electronic systems employed in a VHS VCR.** |
| **Assessment criteria** | 6.1 Describe the E-E modes.<br><br>6.2 Describe the basic purpose of the system and servo controls.<br><br>6.3 Describe the basic purpose of colour under recording.<br><br>6.4 Draw a basic block diagram of the overall VHS VCR electronic systems including single blocks for:<br>- chroma processing<br>- capstan servo control<br>- drum servo control<br>- system control<br>- tuner and IF<br>- display and control panel<br>- audio stages<br>- luminance stages. |

## 8. Delivery of the module

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

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| **Resource requirements** | Resources should be sufficient for students to carry out practical exercises on an individual basis. This will require a range of television receivers and test equipment.<br><br>Useful references include:<br><br>Schoenbeck R 1996, *Electronic Video Systems*<br>Prentice Hall, Englewood Cliffs<br>ISBN 0-02-408013-6<br><br>Trundle E 1996, *Newnes Guide to TV and Video Technology*<br>Butterworth-Weinermann Oxford<br>ISBN 07506 23748<br><br>Botto D 1992, *A Basic Guide to Colour TV and VCRs*<br>Electronics Australia, Federal Publishing, Alexandria |
| **Occupational health and safety requirements** | A safe and healthy environment will be provided for students and teachers as well as safe procedures with regard to learning / teaching activities. |