Radio, TV & Electronic Work - National Technical Certificate (NTC) and Advanced National Technical Certificate (ANTC)

Advanced Courses

Colour Television

PROGRAMME:	Advanced National Technical Certificate in Radio, TV & Electronic Work
MODULE:	CRT 21 - Colour Television
DURATION:	288 Hours
PRE-REQUISITE	CRT 16
GOAL:	This course is intended to provide the trainee with knowledge and skill to enable him install, and maintain coloured television set.

GENERAL OBJECTIVES:

On completion of this module, the trainee should be able to:

1 Understand the process of receiving and reproducing sound and picture in colour television receiver.
2 Diagnose and clear faults of the common types found in every stage of a colour television set.
3 Understand the principles of colour mixing.

PROGRAMME: ADVANCED NATIONAL TECHNICAL CERTIFICATE IN RADIO, TELEVISION & ELECTRONIC WORK			
COURSE: CRT 21 COLOUR TELEVISION		Course Code: CRT 21	Contact Hours: 3-6
Course Specification: At the end of the course students will be able to understand the process of sound and picture reception and production in colour TV receiver.			
	General Objective: 1.0 Understand the process of receiving and producing sound and picture in a colour television receiver. Term 1		
Week	Specific Learning Outcome:	Teacher's Activities	Learning Resources
1-3 4-6 7-8 9-11 12-13	1.1 Describe how sound and picture are transmitted and received using typical block diagram of a transmitter and receiver sets. 1.2 Explain the following terms to illustrate picture quality of a colour television set: a. Hue control b. Tint control c. Saturation and colour control 1.3 Explain how picture and sound signals are processed at different stages of a colour television set. 1.4 Explain the working principles of a colour decoder: a. Chrominance amplifier b. Burst gate amplifier c. Phase detector d. Colour killer e. Phase shift network f. R.G.B Matric & associated circuits 1.5 Differentiate between static and dynamic colour convergence.	• Introduce the concept of colour television as distinct from black & white television. Then use typical block diagram to illustrate the concept of transmission and reception. • Discuss Hue control & Tint control. Ask questions pertaining to the discussion • Discuss saturation & colour. Ask questions pertaining to the discussion. Illustrate the processing of picture & sound signals at different stages in colour television system. • Present the topic on colour decoder and highlight the functional operations of the chrominance amplifier, and Burst gate amplifier. • Phase shift network and R.G.B. matrix and associated circuits. • Introduce the theory of static and dynamic colour convergence. Follow up with questions and answers. -do-	• Block diagram of TV transmission /reception. Colour television receiver set. • Block diagram of TV transmission and reception • Block diagram depicting the processing of picture and sound at difference stages of colour television reception. • Chrominance Amplifier unit • Burst Gate Amplifier unit • Phase Detector unit • Delay line unit • R.G.B. Matrix & Associated circuits. • Diagram to illustrate the difference between static and dynamic colour convergence. • Colour television receiver (set)

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COURSE: CRT 21 COLOUR TELEVISION		Course Code: CRT 21	Contact Hours: 3-6
Course Specification: At the end of the course students will be able to understand the process of sound and picture reception and production in colour TV receiver.			
	General Objective 2.0: Diagnose and clear faults of the common type found in every stage of a colour television set. Term 2, Contact Hour: 2-6		
Week	Specific Learning Outcome:	Teacher's Activities	Learning Resources
1-13	2.6 Identify the symptoms in each stage of the television set. 2.7 Clear faults, in any of the stages. 2.8 Operate the colour bar generator. 2.9 Use de-gausing coil and other television servicing equipment.	• Enumerate the common faults in colour TV receiver. • Provide the instrument for fault diagnosis/trouble shooting. Supervise students on trouble shooting practical. • Drill students on the operation of colour bar generator. • Demonstrate to the students the use of de-gausing coil and other servicing equipments.	• Chart indicating common faults.\Colour bar generator. • Fr-gausing coil.
	General Objective 3.0: Understand the principles of colour mixing		
Week	Specific Learning Outcome:	Teacher's Activities	Learning Resources
1-13	3.1 The primary, colour (i) red, (ii) green (iii) blue 3.2 The complementary colours magenta, cyan, yellow and white 3.3 Derive U components 3.4 Derive V components	• Present chart on primary colour mixing • Present chart on compliment colour mixing • Recall colour ratio to derive U. • Still to derive the value of V.	• Chart of primary colours. • Chart of complimentary colours • Formula for derivation U • Formula for derivation of V.
	General Objective 4.0: Diagnose and clear faults of the common type found in every stage of a colour television set. Term 3, Contact Hour: 2-6		
Week	Specific Learning Outcome:	Teacher's Activities	Learning Resources
	4.1 Identify faults on any colour television set. 4.2 Clear faults in any stage of colour television set. 4.3 Operate all colour television controls. 4.4 Operate all instrument use for the servicing of colour television sets.	• Students to perform exercises	• Colour TV • Tools • Measuring • Instruments

Radio and Electronic Systems

PROGRAMME:	Advanced National Technical Certificate in Television and Electronic Work.
MODULE:	CRT 22 - Radio and Electronic Systems
DURATION:	240 HRS
PRE-REQUISITE	CRT 14
GOAL:	The course is intended to provide the trainee with the knowledge and skill to enable him install, assemble and repair FM receivers, tape recorders and double super-heterodyne receivers. set.

GENERAL OBJECTIVES:

On completion of this module, the trainee should be able to:

1. Understand the working principle of hi-fidelity receiver and be able to align the set.
2. Carry out the characteristic test on a tape recorder to ascertain the performance tuner.
3. Understand the working principles of a double super-heterodyne receiver and be able to eliminate faults due to adjacent channel and image channel interference.
4. Understand the working principles of a double super-het receiver and be able to eliminate faults.
5. Understand the operation of audio and video equipment.

PROGRAMME: ADVANCED NATIONAL TECHNICAL CERTIFICATE IN RADIO, TELEVISION & ELECTRONIC WORK			
COURSE: CRT 22 RADIO AND ELECTRONIC SYSTEMS		Course Code: CRT 22	Contact Hours: 3-6
Course Specification			
	General Objective: 1.0 Understand of the working principle of hi-fidelity receiver and be able to align the set. Term 1		
Week	Specific Learning Outcome:	Teacher's Activities	Learning Resources
1-13	1.1 Explain the working principles of an FM stereo receiver. 1.2 Explain the working principle of amplifiers and associated stereophonic system such as: - room equalizer, octave equalizer. 1.3 Carry out receiver performance test to verify the specification of the system e.g. sensitivity and selectivity 1.4 Carry out receiver performance test to verify the specification of the system e.g. sensitivity and selectivity.	• Introduce concept of FM transmission & reception using block diagram and explain the working principle. • Explain the working principle of amplifier and stereophonic system using schematic diagram. • Provide equipment & instrument for carrying out selectivity and sensitivity test in a stereo receiver system. • Provide equipment and instruments for carrying out the following tests • Image rejection ratio • Noise factor • Stereo decoder alignment	• Block diagram & schematic diagram of FM stereo receiver. • Block diagram & schematic diagram of amplifiers, associated stereo phone system as room equalizer, octave equalizer • Filed strength meter, oscilloscope FM stereo receiver, voltmeter, ohmmeter, and Alignment kit. • Stereo demonstration board.

PROGRAMME: ADVANCED NATIONAL TECHNICAL CERTIFICATE IN RADIO, TELEVISION & ELECTRONIC WORK			
COURSE: CRT 22 RADIO AND ELECTRONIC SYSTEMS		Course Code: CRT 22	Contact Hours: 3-6
Course Specification			
	General Objective: 2.0 Carry out the characteristic test on a tape recorder to ascertain the performance tuner		
Week	Specific Learning Outcome:	Teacher's Activities	Learning Resources
1-13	2.1 Describe the construction and characteristic of audio and video tape recorder. 2.2 Describe the construction and characteristic of video compact disc (VCD) and player set. 2.3 Explain the meaning of equalization 2.4 Explain the need for and method of equalization. 2.5 Explain the need for the bias of the recording head. 2.6 Interpret the schematic diagrams of a cassette cartridge mechanism 2.7 Carry out these test on a tape recorder: a. Azimuth alignment test b. Bias oscillator tuning 2.8 Carry out WOW flutter effect tests on a tape recorder. 2.9 Carry out test to determine the signal to noise ratio on a tape recorder. 2.10 Carry out test on frequency response of tape pre-amplifier on a tape recorder.	• Introduce the phenomenon of audio and video recording using block and schematic diagrams to explain the system. • Introduce the phenomenon of video compact disc and player set. Using block and schematic diagrams. • Illustrate the concept of equalization. • Explain the need for and method of equalization • Discuss the need for bias for recording head. • Drill students on the interpretation of schematic diagrams for Cassette cartridge mechanism assign schematic diagrams to students for them to interpret. • Demonstrate how to carry out the azimuth alignment test and bias oscillator-tuning test. • Demonstrate how the carry out the WOW/flutter effect test. • Demonstrate how to carry out the test to determine the signal to noise ratio on a tape recorder. • Carry out the test on the frequency response of tape pre-amplifier stage.	• Block schematic and circuit diagram of simple tape • Recording machine, video tape recorder video compact disc/player/VCD recorder. • Alignment set chart depicting frequency response of tape pre-amplifier • Recording head set, pictoral chart. • Recording head & pictoral diagram. • Cassette recorder, player set scheme. • Alignment kit and tape recorder. • Signal tracer, alignment kit and tape recorder. • Pictorial chart depicting frequency response of pre-amplifier stage of a tape recorder.

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COURSE: CRT 22 RADIO AND ELECTRONIC SYSTEMS		Course Code: CRT 22	Contact Hours: 3-6
Course Specification			
	General Objective: 3.0 Understand the working principle of double super heterodyne receiver and able to eliminate faults due to adjacent channel and image channel interference. Term 2 Contact Hour: 3-5		
Week	Specific Learning Outcome:	Teacher's Activities	Learning Resources
1-13	3.1 Explain the working principles of a double super-heterodyne receiver 3.2 Draw and interpret the block diagram of a double super heterodyne receiver. 3.3 Clear faults due to adjacent channel interference and image channel interference.	• Illustrate with diagram the working principles of a double super heterodyne receiver. • Explain the block diagram of a double super heterodyne receiver. • Provide equipment and supervise student in clearing faults due to adjacent channel interference and image channel interference.	• Double super heterodyne receiver set. • Block diagram of double super heterodyne receiver. • Alignment kit, signal, Non magnetic screw driver etc.
	General Objective 4.0: Understand the working principles of a double super het receiver and be able to eliminate faults.		
Week	Specific Learning Outcome:	Teacher's Activities	Learning Resources
1-12	4.1 Operate all type of FM stereo receiver, amplifiers and equalizers 4.2 Repair and service stereo receiver, amplifier and equalizers 4.3 Operate all instrument needed for servicing and maintenance of stereo sets & video compact disc.	• Students to carry out exercises.	• Tools • Amplifiers set • Radio set • Video • Measuring instrument.

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COURSE: CRT 22 RADIO AND ELECTRONIC SYSTEMS		Course Code: CRT 22	Contact Hours: 3-6
Course Specification			
	General Objective 5.0: Understand the operation of audio and video equipment. Term 3 Contact Hours: 2-5		
Week	Specific Learning Outcome:	Teacher's Activities	Learning Resources
1-12	5.1 Operate all type of audio and video recording equipment. 5.2 Diagnoses of all fault in relation to audio and video equipment including VCD. 5.3 Repair of all electronics and mechanical fault related to video, audio and C.D. equipment. 5.4 Test and Measurement: - 5.5 Azimuth alignment 5.6 Bias oscillation tuning 5.7 WOW/Flutter effect test 5.8 Signal to noise ratio test 5.9 Frequency response test 5.10 Clear faults due to all types of interference (channel)	-do-	-do-