

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

Satellite Transmissions and Reception

PROGRAMME:	National Technical Certificate in Radio, TV & Electronic Work
MODULE:	CRT - 15 Satellite Transmissions and Reception. (TV, CCTV & ANCILLARY TECHNOLOGY)
DURATION:	300 Hours
PRE-REQUISITE:	
GOAL:	This module is aimed at making the trainee to understand the Basic Concept of Satellite Transmission and Reception
GENERAL OBJECTIVES:	
<p>On completion of this module, the trainee should be able to:</p> <ol style="list-style-type: none"> 1.0 Understand the Basic Concept of Satellite Transmission and Reception. 2.0 Know the Principles of Operation of TV. 3.0 Understand the principles of TV camera and closed circuit TV. 	

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN RADIO, TELEVISION AND ELECTRONIC WORK

COURSE: CRT 15 SATELITE TRANSMISSION AND RECEPTION. (TV, CCTV & ANCILLARY TECHNOLOGY)	Course Code: CRT 15	Contact Hour: 2-3
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Course Specification YEAR 2, TERM 2

General Objective 1.0: Understand the Basic Concept of Satellite Transmission and Reception

Week	Specific Learning Outcome:	Teacher's Activities	Learning Resources
1-13	<p>1.1 Explain the basic principle of Radio and Television transmission using repeater stations for a wider area coverage (terrestrial transmission).</p> <p>1.2 Explain the basic concept of image formation at the focal point of a concave mirror.</p> <p>1.3 Explain Multicast transmission over microwave frequencies e.g.</p> <p>a. Voice (Telephones)</p> <p>b. Video (Television)</p> <p>c. Data (Facsimile).</p>	<ul style="list-style-type: none"> • Relate Repeater Stations to Geo-Stationary Satellite parked in space for purpose of global (wider) coverage of transmission. (Satellite transmission). • Demonstrate reception of long distance Radio frequency on a Satellite Radio. • Explain and Relate the concave mirror to a parabolic receiving antenna with the Low Noise Amplifier placed at the focal point to pick up signal at a line-of-sight. • Organise a visit to a Satellite T.V. and Radio transmitting station. (AIT, MINAJ, NTA). • Demonstrate to students Satellite transmission 	<ul style="list-style-type: none"> • Chalk Board • Satellite Radio Receiver (World Receiver set). • TV Broadcast Stations
12-13	<p>1.4 Introduce and Explain the functions of:-</p> <p>Parabolic antenna dish</p> <p>Low Noise Down Converter - Amplifier (LND, LNC, LNA, LNB, etc)</p> <p>Coaxial Cable</p> <p>Satellite Receivers/Decoders</p>	<ul style="list-style-type: none"> • Explain using diagram, reception and processing of signal from Satellite to Television • Calculate the focal point (F) of any parabolic dish antenna using $F = \frac{2\pi r d}{D^2}$ (formula to be verified please) Where <ul style="list-style-type: none"> d = Diameter of dish D = depth of dish. • Students to: <ul style="list-style-type: none"> • Assemble and Install a Knocked down C - band • Parabolic dish antenna directed at any or many free to air Satellite. 	<ul style="list-style-type: none"> • Satellite location and footprint manual • Plan (magnetic) • Measuring tape (steel) • Complete set of spanners • 2.0 meter Knocked down parabolic dish antenna. C - Band • Low Noise Down converter (LND) • Coaxial Cable <ul style="list-style-type: none"> • Satellite Receiver • Colour Television.

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Course Specification YEAR 2, TERM 2			
• CABLE TELEVISION Year 2 Term 3 Contact Hours 2-3			
1-4	1.5 Explain the General principle of Television signal distribution through Coaxial cables.	• Carry out a two point distribution from one signal source NCR to two Television.	• Chalk Ink Board • Video Cassette Recorder • Mini T.V. Signal Sender
5-8	1.6 Explain Television signal distribution through Wireless transmitter (Multiple Channel, Multiple Distribution System MMDS).	• Explain with the aid of diagram MMDS transmission and reception • Demonstrate to student using wireless T.V. Sender, signal distribution from a source to multiple points.	• Television • Coaxial Cable • T.V. Connectors and necessary tools.
9-13	1.7 Explain types of receiving antenna and their components a. Yagi b. Concave antenna c. MMDS LND.	• Explain with the aid of diagram the various antenna designs.	• Chalk Board
General Objective 2.0: Principles of Operation of TV			
Week	Specific Learning Outcome:	Teacher's Activities	Learning Resources
1-4	2.1 Describe the principles of a. Power supply b. R.F. amplifier c. Mixer and local oscillator. d. IF amplifier stages	• Use a typical schematic diagram of a Black and White television receiver, isolate the mentioned stages and describe the operational principles of these stages.	• Schematic diagram, a typical black and white television receiver.
5-8	2.2 Describe the principles of e. CRT circuit		
9-13	f. Sync stages g. Vertical and horizontal deflection circuits		
	2.3 Sound IF stage including speaker AF amplifier stages.		

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Course Specification YEAR 2, TERM 2			
General Objective 3.0: Understand the principles of camera and closed circuit TV. Year 3, Term 1			
Contact Hours: 4-1			
Week	Specific Learning Outcome:	Teacher's Activities	Learning Resources
1-13	<p>3.1 Explain the basic Principle of Television Surveillance for security Explain the relative difference between</p> <ul style="list-style-type: none"> a. CCTV Monitor b. T.V. Receiver c. CCTV Camera d. Video Camera <p>Door Store TV.</p> <p>3.2 Explain the Principle and installation of security panel incorporating</p> <ul style="list-style-type: none"> a. Door Phone TV; and b. Door latching system 	<ul style="list-style-type: none"> • Explain using Diagram remote sensing of TV signal and transmission through Cable and wireless to Monitors • Explain the principle of magnetic door latching and practical installation of a complete system. 	<ul style="list-style-type: none"> • Chalk Ink Board • Television Receivers • Mini CCD Monitor Camera
1-13	<p>3.3 Explain how video signal produces good picture quality.</p> <p>3.4 Explain how picture and sound signals are processed in different stages of a black & white television set.</p> <p>3.5 Monitor the action of the controls on a television receiver.</p>	<ul style="list-style-type: none"> • Explain the need for the production of good quality pictures and how this is achieved using video signal (e.g. synch. Pulses-vertical & horizontal) • Using a block diagram chart, explain how sound and picture signals are processed in different stages of a black and white television receiver. • Use a Black and white television receiver to identify users and service controls, and observe the effect of each on the picture and sound quality. • Principles of these stages. 	<ul style="list-style-type: none"> • Chart on black diagram of a black & white TV receiver (PAL). • Black and white television receiver, VCR or transmitter signals from a station.