NATIONAL SKILLS QUALIFICATION

LEVEL 3

TITLE:

SATELLITE TV ANTENNA INSTALLATION AND MAINTENANCE

YEAR: 2024

NATIONAL SKILLS QUALIFICATION

NSQ LEVEL 3 - *STAETILLATE TV INSTALLATION SPECIALIST*
GENERAL INFORMATION

QUALIFICATION PURPOSE

This qualification aims at exposing the on competent skills on a comprehensive list of tools, advanced equipment, and technical practices that reflect global standards in satellite technology.

QUALIFICATION OBJECTIVES

The learner should be able to

i. Install, configure, and troubleshoot complex satellite systems, including motorized antennas and Mult switch setups.
ii. Use advanced tools like satellite signal meters and spectrum analyzers for precise installations and diagnostics.
iii. Follow international standards and regulations for satellite installation, delivering compliant and high-quality work.

Mandatory Units

Unit No	Reference Number	NOS Title	Credit Value	Guided Learning Hours	Remark
Unit 001	ICT/SAT/001/L3	Health and Safety	2	20	*Mandatory*
Unit 002	ICT/SAT/002/L3	Communication	2	20	*Mandatory*
Unit 003	ICT/SAT/003/L3	Teamwork	2	20	*Mandatory*
Unit 004	ICT/SAT/004/L3	Tools and Equipment for Satellite Installation	3	30	*Mandatory*
Unit 005	ICT/SAT/005/L3	Advanced Satellite Dish Settings and Configurations	3	30	*Mandatory*
Unit 006	ICT/SAT/006/L3	Testing and Troubleshooting Advanced Satellite Systems	3	30	*Mandatory*
		TOTAL	15	150	

NOTE: *Explain how the learner can achieve the total credit hours from mandatory and optional units*

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LEVEL 3: *SATELLITE TV INSTALLATION SPECIALIST*

Unit 001: OCCUPATIONAL HEALTH AND SAFETY

Unit Reference Number: ICT/SAT/001/L3

NSQ Level: 3

Credit Value: 3

Guided Learning Hours: 30

Unit Purpose:

This unit aims to equip Trainees with the essential knowledge and practical skills required to ensure workplace health and safety while conducting satellite TV antenna installation and maintenance tasks.

Unit assessment requirements/ evidence requirements:

Assessment must be carried out in real workplace environment in which learning and human development is carried out.

Assessment methods to be used include:

1. Direct Observation/oral questions (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Assignment (ASS)

UNIT 001: OCCUPATIONAL HEALTH AND SAFETY

LEARNING OBJECTIVE (LO) **The learner will:**		**PERFORMANCE CRITERIA** **The learner can:**	**Evidence Type**					**Evidence Ref. Page No.**			
LO 1: Principles and Practices of Health and Safety	1.1	Conduct a detailed risk assessment for satellite installation activities, focusing on potential hazards such as working at heights, electrical risks, and falling objects.									
	1.2	Explain new hazards that may arise from changing weather conditions, site layout, or complex installations (e.g., urban vs. rural environments).									
	1.3	Demonstrate control measures to mitigate identified hazards, including the use of barriers, warning signs, and proper work zoning.									
	1.4	Know importance of implementing control measures through continuous monitoring during the installation process.									
LO 2: Application of Advanced Personal Protective Equipment (PPE) and Safety Gear	2.1	Identify appropriate PPE specific to complex satellite installations, such as full-body harnesses, shock-absorbing lanyards, and insulated gloves for electrical safety.									
	2.2	Demonstrate procedures for inspecting and maintaining PPE to ensure functionality, including checking expiration dates and performing routine equipment inspections.									
	2.3	Explain the importance of ergonomics when selecting PPE for extended periods of use, particularly for tasks involving repetitive movements or working in awkward positions.									
	2.4	Perform a safety drill involving the use of PPE, simulating emergency situations (e.g., a fall or electrical shock) and demonstrating proper response techniques									
LO 3: Emergency Preparedness and Response Procedures	3.1	Develop emergency response plans specific to satellite installations, addressing fire, electrical hazards, and working at heights emergencies.									
	3.2	Explain role of emergency evacuation plans and the importance of identifying and									

LEARNING OBJECTIVE (LO) The learner will:		PERFORMANCE CRITERIA The learner can:	Evidence Type					Evidence Ref. Page No.			
		maintaining clear escape routes during large installations.									
	3.3	Demonstrate emergency communication devices (e.g., two-way radios, emergency alarms) to notify team members and emergency services during a crisis.									
	3.4	Carry out emergency evacuation drill, where learners practice responding to an incident such as a fire or medical emergency, ensuring all safety protocols are followed.									
Learner's Signature			Date:								
Assessor's Signature			Date:								
IQA's Signature			Date:								
EQA's Signature			Date:								

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LEVEL 3: *SATELLITE TV INSTALLATION SPECIALIST*

Unit 002: Communication in workplace

Unit Reference Number: ICT/SAT/002/L3

NSQ Level: 3

Credit Value: 3

Guided Learning Hours: 30

Unit Purpose:

To develop effective communication skills essential for trainees' interactions within the satellite TV antenna installation industry.

Unit assessment requirements/ evidence requirements:

Assessment must be carried out in real workplace environment in which learning and human development is carried out.

Assessment methods to be used include:

1. Direct Observation/oral questions (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Assignment (ASS)

UNIT 002: COMMUNICATION IN A WORKPLACE

LEARNING OBJECTIVE (LO) **The learner will:**		**PERFORMANCE CRITERIA** **The learner can:**	**Evidence Type**					**Evidence Ref. Page No.**			
LO 1: Advanced Professional Communication Techniques	1.1	Demonstrate clear and concise verbal communication to convey technical instructions and safety guidelines during satellite installation projects.									
	1.2	Explain active listening techniques in discussions with team members and clients, ensuring that feedback and concerns are understood and addressed.									
	1.3	Explain tailoring communication to suit the audience, such as using technical language with colleagues and simplified explanations for clients or non-technical personnel.									
	1.4	Role-playing exercise where learners manage communication between team members and clients, focusing on clarity, tone, and professionalism.									
LO 2: Handling Communication in High-Pressure Situations	2.1	Demonstrate maintain composure and use effective communication during high-pressure scenarios, such as project delays or safety incidents.									
	2.2	Explain assertive communication to resolve conflicts within a team or with clients without escalating the situation.									
	2.3	Apply de-escalation techniques when communicating with clients or team members who may be upset or frustrated due to unforeseen project challenges.									
	2.4	Simulate situation where learners must communicate effectively with both their team and clients to resolve a project issue or safety concern.									
LO 3: Digital Communication Tools for Remote Work and Team Coordination	3.1	Use of digital communication tools (e.g., email, project management software, messaging apps) for coordinating remote teams during satellite installations.									
	3.2	Explain the importance of keeping detailed digital communication records, including email chains, project updates, and client feedback, to ensure accountability and traceability.									

LEARNING OBJECTIVE (LO) The learner will:		PERFORMANCE CRITERIA The learner can:	Evidence Type					Evidence Ref. Page No.			
	3.3	Know Role of video conferencing and virtual collaboration tools in facilitating communication between geographically distributed teams.									
	3.4	Demonstrate monitoring remote satellite installation project using digital communication tools.									
Learner's Signature			Date:								
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Unit 003: TEAMWORK

Unit Reference Number: ICT/SAT/003/L3

NSQ Level: 3

Credit Value: 3

Guided Learning Hours: 30

Unit Purpose:

The focus is on fostering a culture of collaboration, mutual respect, and accountability to enhance productivity and innovation.

Unit assessment requirements/ evidence requirements:

Assessment must be carried out in real workplace environment in which learning and human development is carried out.

Assessment methods to be used include:

1. Direct Observation/oral questions (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Assignment (ASS)

UNIT 003: TEAMWORK

LEARNING OBJECTIVE (LO) **The learner will:**		**PERFORMANCE CRITERIA** **The learner can:**	**Evidence Type**					**Evidence Ref. Page No.**			
LO 1: Advanced Team Dynamics and Leadership Skills	1.1	Explain roles and responsibilities within a satellite installation team.									
	1.2	Demonstrate leadership techniques that promote team cohesion.									
	1.3	Discuss the importance of adaptability within a team.									
	1.4	Conduct a group exercise where learners assume different leadership roles and work on solving a project challenge, applying team dynamics and leadership principles.									
LO 2: Collaborative Problem-Solving in Satellite Installation Projects	2.1	Demonstrate complex satellite installation challenges									
	2.2	Apply critical thinking and collaborative decision-making techniques.									
	2.3	Explain time management in collaborative work.									
	2.4	Perform a group task where trainees must collaboratively solve a technical problem (e.g., a signal issue) using effective communication, resource allocation, and decision-making skills.									
LO 3: Building Trust and Accountability in Teams	3.1	Discuss the role of trust in high-functioning teams and how establishing clear expectations and transparency leads to better collaboration and accountability.									
	3.2	Explain the impact of individual accountability on team success, focusing on how each member's contribution affects the overall project outcome.									
	3.3	Demonstrate techniques for providing constructive feedback and encouraging self-assessment to improve performance and foster accountability in a team setting.									
	3.4	Conduct an activity where learners give and receive feedback within a team,									

LEARNING OBJECTIVE (LO) The learner will:		PERFORMANCE CRITERIA The learner can:	Evidence Type					Evidence Ref. Page No.			
		focusing on building trust and accountability through open communication and mutual respect.									
Learner's Signature			Date:								
Assessor's Signature			Date:								
IQA's Signature			Date:								
EQA's Signature			Date:								

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Unit 004: TOOLS AND EQUIPMENT FOR SATELLITE TV ANTENNA INSTALLATION

Unit Reference Number: ICT/SAT/004/L3

NSQ Level: 3

Credit Value: 3

Guided Learning Hours: 30

Unit Purpose:

To provide learners with comprehensive knowledge and practical experience to handle standard tools, specialized signal meters, and diagnostic equipment to ensure precise, efficient, and professional installations.

Unit assessment requirements/ evidence requirements:

Assessment must be carried out in real workplace environment in which learning and human development is carried out.

Assessment methods to be used include:

1. Direct Observation/oral questions (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Assignment (ASS)

UNIT 004: TOOLS AND EQUIPMENT FOR SATELLITE TV ANTENNA INSTALLATION

LEARNING OBJECTIVE (LO) **The learner will:**		**PERFORMANCE CRITERIA** **The learner can:**	**Evidence Type**					**Evidence Ref. Page No.**			
LO 1: **Basic Tools (Standard for All Levels)**	1.1	Describe basic tools such as Screwdrivers (Phillips, flathead), Drills (corded or cordless), Wrenches and Ratchets, Wire cutters/Strippers, Pliers, and cables ties									
	1.2	Discuss different types and brands of tools. For example, compare cordless vs. corded drills for different installation environments (e.g., residential vs. commercial).									
	1.3	Select tools based on installation needs, including durability, power, and adaptability to different job types.									
LO 2: Understand the procedure of Mounting Satellite TV Equipment	2.1	Identify the necessary tools, materials, and safety gear required for the installation.									
	2.2	Inspect the satellite dish and related equipment for defects or damage.									
	2.3	Use appropriate tools to securely mount the dish on walls, poles, or other structures.									
	2.4	Use a satellite signal meter or compatible software to locate the satellite and optimize signal strength.									
	2.5	Use weather-resistant coaxial cables and connectors for outdoor installations.									
	2.6	Connect the satellite receiver to the TV and verify signal input.									
	2.7	Use ladders, harnesses, or other equipment to ensure safe working conditions at heights.									
	2.8	Demonstrate the ability to troubleshoot minor signal or connectivity issues.									

LEARNING OBJECTIVE (LO) The learner will:		PERFORMANCE CRITERIA The learner can:	Evidence Type					Evidence Ref. Page No.			
LO 3: Introduction to Digital and Software Tools for Satellite Alignment	3.1	use digital satellite finders to achieve precise satellite alignment.									
	3.2	Use smartphone apps and software-based tools to calculate azimuth, elevation, and polarization angles based on geographic location.									
	3.3	Compare the accuracy and ease of use between traditional manual tools and digital alignment tools for both commercial and residential installations.									
LO 4: Calibration and Maintenance Tools for Satellite Equipment	4.1	Discuss the importance of regular calibration and maintenance of satellite installation tools, such as **signal meters**, **oscilloscopes**, and **calibration kits**.									
	4.2	Calibrate a **signal strength meter** for accurate readings during dish alignment and maintenance.									
	4.3	Use **electrical test tools** (e.g., multimeters) to diagnose power supply issues and faulty components in satellite receivers and amplifiers.									
	4.4	Perform routine maintenance on installation tools, including testing signal accuracy, recalibrating tools, and ensuring the integrity of cables and connectors.									

Learner's Signature	Date:
Assessor's Signature	Date:
IQA's Signature	Date:
EQA's Signature	Date:

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Unit 005: ADVANCED SATELLITE DISH SETTING AND CONFIGURATIONS

Unit Reference Number: ICT/SAT/005/L3

NSQ Level: 3

Credit Value: 3

Guided Learning Hours: 30

Unit Purpose:

To develop advanced skills in configuring and aligning satellite dishes for optimal performance, including motorized systems and Mult satellite setups.

Unit assessment requirements/ evidence requirements:

Assessment must be carried out in real workplace environment in which learning and human development is carried out.

Assessment methods to be used include:

1. Direct Observation/oral questions (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Assignment (ASS)

UNIT 005: ADVANCED SATELLITE DISH SETTING AND CONFIGURATION

LEARNING OBJECTIVE (LO) **The learner will:**		**PERFORMANCE CRITERIA** **The learner can:**	**Evidence Type**					**Evidence Ref. Page No.**			
LO 1: Understand Dish Alignment and Tracking	1.1	Discuss Dish Alignment with Geostationary Satellite									
	1.2	Discuss Motorized Satellite Antennas (DiSEqC Motor)									
	1.3	Program DiSEqC (Digital Satellite Equipment Control)									
	1.4	Explain Polar Mount Systems									
	1.5	Troubleshooting common issues with polar mount systems, such as misalignment or motor failure									
LO 2: Understand Multiswitch Systems	2.1	Describe Single Satellite to Multiple Receiver Setup									
	2.2	Discuss Multisatellite Configuration									
	2.3	Configure Cascade Systems for Apartment Buildings									
LO 3: **Signal Distribution and Integration**	3.1	Demonstrate Signal Amplification and Attenuation									
	3.2	Diagnose issues related to signal degradation over long cable runs.									
	3.3	Fix issues found in 3.2									
	3.4	Combine Satellite TV with Terrestrial (TV Aerial) Signals									
	3.5	Discuss SMATV (Satellite Master Antenna Television)									
LO 4: Testing and Troubleshooting Advanced Satellite Systems	4.1	Use Spectrum Analyzer for Interference Detection									
	4.2	Identify different types of interference (e.g., electromagnetic, signal overlap) and how to resolve them.									
	4.3	Use Field Strength Meters for signal detection									
	4.4	Perform Satellite Receiver Firmware Updates									
	4.5	Identify Cable Faults									
	4.6	Resolve 4.5									

Learner's Signature	Date:
Assessor's Signature	Date:
IQA's Signature	Date:

EQA's Signature	Date:

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Unit 006: TESTING AND TROUBLESHOOTING ADVANCED SATELLITE SYSTEMS

Unit Reference Number: ICT/SAT/006/L3

NSQ Level: 3

Credit Value: 3

Guided Learning Hours: 30

Unit Purpose:

This unit ensures learners can identify and fix signal problems, cable faults, and system malfunctions, maintaining high-quality performance standards.

Unit assessment requirements/ evidence requirements:

Assessment must be carried out in real workplace environment in which learning and human development is carried out.

Assessment methods to be used include:

1. Direct Observation/oral questions (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Assignment (ASS)

UNIT 006: TESTING AND TROUBLESHOOTING ADVANCED SATELLITE SYSTEMS

LEARNING OBJECTIVE (LO) **The learner will:**		**PERFORMANCE CRITERIA** **The learner can:**	**Evidence Type**					**Evidence Ref. Page No.**			
LO 1: **Understand Advanced Signal Testing Tools**	1.1	Use Advanced Spectrum Analyser for Satellite Systems									
	1.2	Explain Signal Path Analysis and Optimization									
	1.3	Advanced Receiver Diagnostics									
	1.4	Signal Quality and Modulation Schemes									
LO 2: **Global Best Practices and Standards**	2.1	Discuss Best Practices for Multi-Satellite Systems									
	2.2	Explain Standards for High-Frequency Satellite Systems									
	2.3	Explain Global Standards for Satellite Security									
	2.4	Discuss Environmental and Sustainability Standards for Satellite Installations									
LO 3: **Signal Optimization Techniques for Satellite Systems**	3.1	Discuss advanced techniques for optimizing signal quality, including the use of **adaptive modulation and coding (ACM)** to adjust for changes in weather and interference.									
	3.2	Explain the role of **error correction methods** like **forward error correction (FEC)** in improving signal integrity and data throughput.									
	3.3	Demonstrate the optimization of satellite dish alignment for **multi-beam satellites** or **high-throughput satellite (HTS)** networks									
	3.4	Explore techniques for optimizing **uplink power control** to minimize interference and maintain signal quality in variable atmospheric conditions.									
LO 4: **Advanced Troubleshooting of Satellite Ground Systems**	4.1	Explain the process of troubleshooting **uplink and downlink** systems, focusing on signal interference, attenuation, and equipment calibration.									
	4.2	Troubleshoot issues with **satellite modems**, **signal amplifiers**, and **low-noise block downconverters (LNBs)**.									
	4.3	Resolve issues in 4.2									

LEARNING OBJECTIVE (LO) The learner will:		PERFORMANCE CRITERIA The learner can:	Evidence Type					Evidence Ref. Page No.			
	4.4	Identify common causes of **signal attenuation** in long-distance cable runs and how to mitigate these issues using **repeaters** and **amplifiers**.									
	4.4	Troubleshoot satellite ground equipment									
	4.5	Explore techniques for maintaining **redundancy** in satellite ground systems.									
Learner's Signature			Date:								
Assessor's Signature			Date:								
IQA's Signature			Date:								
EQA's Signature			Date:								

CRITIQUE TEAM LIST

SN	Name	ADDRESS	EMAIL AND PHONE
1	Ikechukwu Jacob Umesi	Mo Solicitors 4 Trinity Close Olodi Apapa, Lagos	iykejacob@gmail.com 08055900895
2	Frank Iheonu	Inits Limited 283 Herbert Macaulay Way, Yaba	iheonufrank@gmail.com 07036999294
3	Chibueze Princewill Okereke	Zenith Bank Group (Zenpay) 5 Roluga Street, Soluyi, Gbagada, Lagos	okerekeprincewill@hotmail.com 07025768487
4	Emmanuel C. Amadi	Federal University of Technology, Owerri	emmanuel.amadi@futo.edu.ng 08062142392
5	Engr. Lawal Abdullahi	Zenith Kad Ict Hub Kaduna	ocplawal@gmail.com 08035169089
6	Muhammad Musa	NBTE	muhammadwaziri@msn.com 08033671027
7	Muhammad, Bilyaminu Musa	NBTE	mahogany@gmail.com 09036071291
8	Muhammad Bello Aliyu	CPN	mbacaspet@gmail.com 08039176984
9	Benjamin, Prince Chukwudindu	CPN	pco.benjamin@gmail.com 08132850544
10	Amoo, Taofeek	CPN	taofeekamoo@gmail.com 08053370334
11	Olatunji Abibat	CPN	adehabb@gmail.com 08054263602
12	Linda Ngbeken	CPN	excel4all2000@yahoo.com 08128219274

VALIDATION TEAM LIST

SN	NAME	ADDRESS	EMAIL AND PHONE
1	Phd. Muhammad Zubairu	NigComSat Abuja	mdzubairu@gmail.com 08035749800
2	Haruna Aliyu Sambo	NigComSat, Abuja	samboruna@gmail.com 08079363900
3	Mustapha Habu	Engausa Global Tech Hub	mustapha@engausa.com 07038224643
4	Engr. Faisal Lawal	Intelbox Solutions, Mabushi Abuja	0806521477
	Dr. Musa Hatim Koko	NBTE	Hatimlion@gmail.com

			08039606948
5	Muhammad Musa	NBTE	muhammadwaziri@msn.com 08033671027
6	Damilola Omokanye	CPN	Maccomoke11@gmail.com 08161503312