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SATELLITE DISH INSTALLER



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LEARNER GUIDE

National Vocational Certificate Level 3

Version 1 - October, 2019



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- This is the main content of your learner's guide with detail of the knowledge and skills (practical activities, projects, assignments, practices etc.) you will require to achieve learning outcomes stated in the curriculum
 - This section will include examples, photographs and illustrations relating to each learning outcome
- **Summary of modules:**
 - This contains the summary of the modules that make up your learner's guide
- **Frequently asked questions:**
 - These have been added to provide further explanation and clarity on some of the difficult concepts and areas. This further helps you in preparing for your assessment.
- **Multiple choice questions for self-test:**
 - These are provided as an exercise at the end of your learner's guide to help you in preparing for your assessment.

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Module-5
LEARNER GUIDE
National Vocational Certificate Level 3

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Module 5: 0619001084 Mount Dish for Uplink / Downlink

Objective of the module: The objective of this module is to provide skills and knowledge related to Fix Dish on Stand for Uplink / Downlink, Locate Foundation Place for Strong Signals, Conduct Signal Test for Downlink, Conduct Signal Test for Uplink, Conduct Positioning Test and Fix Dish Assembly Permanently

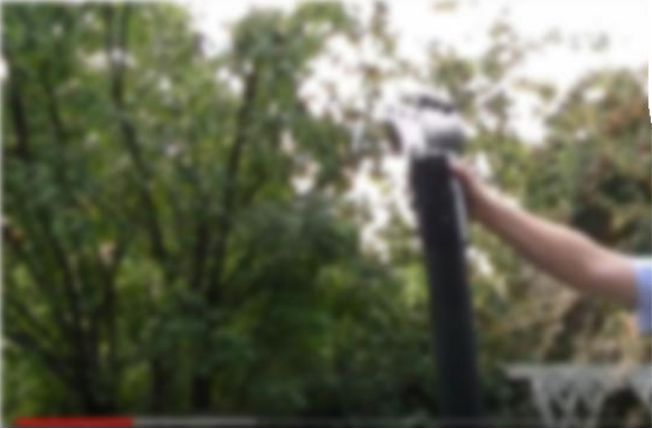
Duration **50** hours **Theory:** **10** hours **Practical:** **40** hours

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
LU1: Fix Dish on Stand for Uplink / Downlink	<p>The student will be able to:</p> <ol style="list-style-type: none"> 1. Identify tools and equipment 2. Mount dish on dish stand 3. Join one end of actuator with stand 4. Joint other end of actuator with dish 	<ol style="list-style-type: none"> 1. • Explain tool required for assembly of dish antenna stand <ol style="list-style-type: none"> a. Electric Drill b. Spirit level c. Compass d. And more... 2. Select tools for dish antenna stand assembly 3. Explain stand requirement dish antenna 4. Examine components of dish antenna stand 	<p>Learner guide Multi-media projector Handouts Videos</p> <p>Tools and Equipment</p> <ul style="list-style-type: none"> • Cable tester • Screw driver set • L-Key • Socket set • Electric Drill Machine

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
		5. Explain assembly diagram of stand assembly 6. Joint actuator with stand and other end with dish. Practical-1 Fix Dish on Stand for Uplink / Downlink	<ul style="list-style-type: none"> • Hammer • Pliers • Hack saw • Drill bits • Spirit level • Satellite finder • Compass • Satellite Directional Chart
LU2: Conduct General Signal Test for Uplink / Downlink	The student will be able to: <ol style="list-style-type: none"> 1. 1. Ensure testing equipment 2. Ensure obstruction-free surrounding 3. Identify East-West directions with compass 4. Set arc direction for 0°, 90°, 180° for revolving dish with satellite finder 5. Adjust limit switches at 0° and 180° for revolving dish 	<ol style="list-style-type: none"> 1. • Explain testing equipment for signal testing <ol style="list-style-type: none"> a. Compass b. Satellite finder 2. Observe site location free of obstruction 3. Set direction of arc with satellite finder Practice-1 Conduct General Signal Test for Uplink / Downlink	Learner guide Multi-media projector Handouts Videos Tools and Equipment as (LU1)
LU3: Locate appropriate Foundation Place	The student will be able to: <ol style="list-style-type: none"> 1. Identify leveled place for foundation. 2. Ensure obstruction-free around the foundation place in case of 	<ul style="list-style-type: none"> ○ Perform survey for site location Practice-1 Locate appropriate Foundation Place	Learner guide Multi-media projector Handouts Videos Tools and Equipment as (LU1)

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
	revolving dish 3. Make leveled place for foundation if required.		
LU4: Conduct Positioning Test	The student will be able to: 1. Place assembled dish antenna on the selected foundation 2. Place non-revolving dish antenna as per requirement 3. Locate pointing angles at different degrees for revolving dish.	1. •Explain dish antenna assembly diagram 2. Assemble dish antenna on foundation 3. Specify pointing angles at different degrees for revolving dish Practice-1 Conduct Positioning Test	Learner guide Multi-media projector Handouts Videos Tools and Equipment as (LU1)
LU5: Fix Dish Assembly	The student will be able to: 1. Identify tools and equipment 2. Fix base of the dish stand with concrete 3. Mount base of the dish stand with rawl bolt 4. Perform signal confirmation test.	1. Check diagram of stand 2. Fix base of dish stand on concrete 3. Fix base of dish with stand. Practice-1 Fix Dish Assembly	• Learner guide Multi-media projector Handouts Videos Tools and Equipment as (LU1)

Examples and illustrations

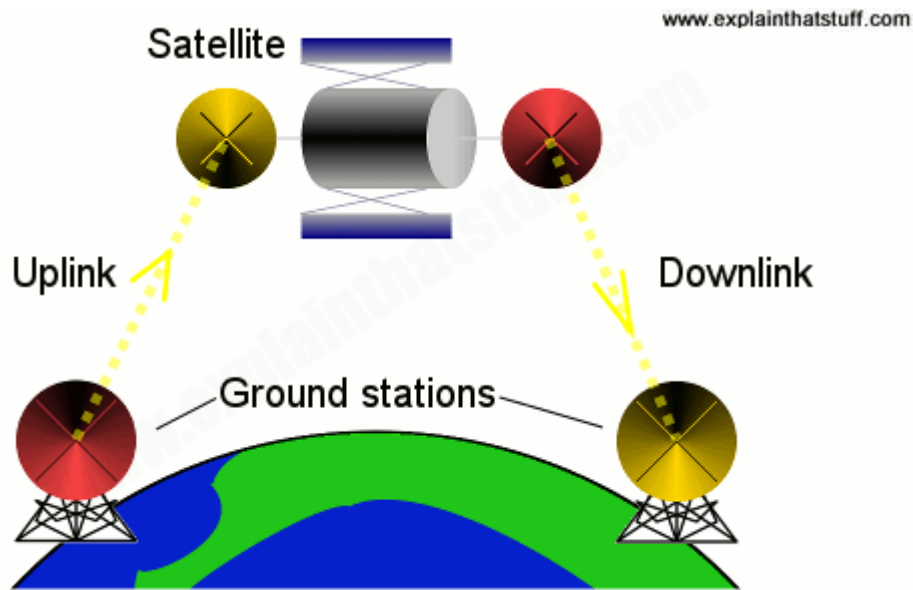
Video	Link
	<p>Setting up a C Ku Band Satellite Dish Part 1 Pole Mount Setup https://www.youtube.com/watch?v=tg5ba_UEHL8</p>



Uplinks and downlinks (Link: <https://www.explainthatstuff.com/satellites.html>)

If you want to send something like a TV broadcast from one side of Earth to the other, there are three stages involved. First, there's the uplink, where data is beamed up to the satellite from a ground station on Earth. Next, the satellite processes the data using a number of onboard transponders (radio receivers, amplifiers, and transmitters). These boost the incoming signals and change their frequency, so incoming signals don't get confused with outgoing ones. Different transponders in the same satellite are used to handle different TV stations carried on different frequencies. Finally, there's the downlink, where data is sent back down to another ground station elsewhere on Earth. Although there's usually just a single uplink, there may be millions of

downlinks, for example, if many people are receiving the same satellite TV signal at once. While a communications satellite might relay a signal between one sender and receiver (fired up into space and back down again, with one uplink and one downlink), satellite broadcasts typically involve one or more uplinks (for one or more TV channels) and multiple downlinks (to ground stations or individual satellite TV subscribers).



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Module-6
LEARNER GUIDE
National Vocational Certificate Level 3

Version 1 - October, 2019

Module 6: 0619001085 Perform Tuning

Objective of the module: The objective of this module is to provide skills and knowledge related to Select Input Mode for Display, Select Satellite in Receiver, Perform Antenna Setting in Receiver, Perform Scanning and Make Channels Groups

Duration **150** hours **Theory:** **10** hours **Practical:** **140** hours

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
LU1: Select Input Mode for Display	The student will be able to: <ol style="list-style-type: none"> 1. Ensure power supply 2. Select display source (VGA, AV, HDMI, RF, Scart) as per input connection 	<ol style="list-style-type: none"> 3. Connect audio video leads with display and receiver 4. Select source audio video Practical-1 Select Input Mode for Display	Learner guide Multi-media projector Handouts Videos Tools and Equipment <ul style="list-style-type: none"> • Satellite information manual (updated) • Receiver user manual
LU2: Select Satellite in Receiver	The student will be able to: <ol style="list-style-type: none"> 1. Open main menu of the receiver 2. Select installation mode 3. Select required satellite for non-revolving dish 4. Select different satellites for revolving dish 	<ol style="list-style-type: none"> 5. Explain receiver menu functions 6. Open main menu of receiver 7. Select installation mode 8. Select required satellite Practice-1 Select Satellite in Receiver	Learner guide Multi-media projector Handouts Videos Tools and Equipment as (LU1)
LU3: Perform Antenna Setting	The student will be able to: <ol style="list-style-type: none"> 1. Open antenna setting 	<ol style="list-style-type: none"> 6. Explain receiver manual function 7. Open antenna setting 	Learner guide Multi-media projector

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
in Receiver	<ol style="list-style-type: none"> 2. Select LNB power on/off 3. Select C-band/Ku-band frequencies 4. Select Diseqc switch ports 5. Select tone/pulse switch 	<ol style="list-style-type: none"> 8. Select LNB Power on 9. Select band frequency 10. Select Diseqc switch port 11. Select tone of switch <p>Practice-1 Perform Antenna Setting in Receiver</p>	Handouts Videos Tools and Equipment as (LU1)
LU4: Perform Scanning	<p>The student will be able to:</p> <ol style="list-style-type: none"> 1. Perform transponder scanning 2. Perform scanning mode (manual, auto, blind, super blind, pre-set) 3. Scan different satellites for revolving dish 4. Save all settings 	<ol style="list-style-type: none"> 5. Search required satellite 6. Scand different satellites for revolving dishes 7. Save all setting <p>Practice-1 Perform Scanning</p>	Learner guide Multi-media projector Handouts Videos Tools and Equipment as (LU1)
LU5: Make Channels Groups	<p>The student will be able to:</p> <ol style="list-style-type: none"> 1. Open channel setting 2. Open channels list 3. Perform setting options (Move, Delete, Rename, Favorite, Groups) 4. Save all settings. 	<ol style="list-style-type: none"> 5. Open channel setting 6. Perform different setting like move , delete, rename and favorite groups 7. Save all setting <p>Practice-1 Make Channels Groups</p>	<ul style="list-style-type: none"> • Learner guide Multi-media projector Handouts Videos Tools and Equipment as (LU1)

Examples and illustrations

Video	Link
	<p>AsiaSat 7 105East Setting on 4 Feet Dish and Scanning https://www.youtube.com/watch?v=TUIoPVLwYWs</p>

Tuning Process: (Link: <https://www.practical-home-theater-guide.com/satellite-dish.html>)

- 1] Adjust the antenna reflector azimuth angle to match that necessary for the particular satellite. This adjustment is the east-west movement of the reflector on the vertical mount and is given in azimuth degrees.
- 2] Adjust the elevation angle; this adjustment is from the horizon to the sky and is given as elevation in degrees above the horizontal plane.
- 3] If you are tracking more than one satellite, you also need to set the dish skew as further detailed in the skew definition above.
- 4] Ensure that the antenna signal line is connected to the receiver and the receiver is turned on and positioned on a beacon channel; the beacon channel is transmitted from the satellite to peak your antenna to it.
- 5] Begin tuning by slowly moving the reflector first to the east in one-degree increments for a total of three degrees, then in the opposite direction (west) while monitoring the receiver's signal meter. Peak the signal to the highest scale at this point. Ideally, this should be done using an inexpensive satellite finder or signal 'strength' meter like the WS International Satellite Finder; these allow for a more precise adjustment thanks to their greater signal sensitivity.

- 6] Lock the antenna azimuth adjustment on the mount once the signal level is maximized.
- 7] Perform the same procedure as in steps 4 through 6, using the elevation adjustment, first up and then down for peaking. Lock the satellite dish elevation at the point of maximum signal reception.
- 8] Ground the antenna and the signal line entrance into the residence to electrical code standards as detailed earlier on in this guide.

The next step is to plug your receiver into a household outlet; turn your television set on and make any necessary adjustments to the satellite system settings. Once ready, you can relax and **enjoy your new satellite TV system!**

Overview of the program

Course: <i>Satellite Dish Installer, Level-3</i>	Total Course Duration: 200 hours
Course Overview:	
<p>The purpose of the training is to provide skilled manpower to improve the existing capacity of Electronics sector. This training will provide the requisite skills to the trainees to Install Satellite Dish. It will enable the participants to meet the challenges in the field of Satellite Dish industry. Further, to improve the skill level of the technician and prepare them for the Electronics industry to meet the market competition nationally and internationally.</p> <p>The core purpose of this qualification is to produce employable Satellite Dish Installer who could Install Satellite Dish according to national and international standards. In addition this qualification will prepare unemployable youth to employee in this sector.</p>	

Module	Learning Unit	Duration
<p>Module 5: Mount Dish for Uplink / Downlink</p> <p>Aim: The objective of this module is to provide skills and knowledge related to Fix Dish on Stand for Uplink / Downlink, Locate Foundation Place for Strong Signals, Conduct Signal Test for Downlink, Conduct Signal Test for Uplink, Conduct Positioning Test and Fix Dish Assembly Permanently</p>	<p>LU1: Fix Dish on Stand for Uplink / Downlink</p> <p>LU2: Conduct General Signal Test for Uplink / Downlink</p> <p>LU3: Locate appropriate Foundation Place</p> <p>LU4: Conduct Positioning Test</p> <p>LU5: Fix Dish Assembly</p>	50 hours

Module	Learning Unit	Duration
<p>Module 6: Perform Tuning</p> <p>Aim: The objective of this module is to provide skills and knowledge related to Select Input Mode for Display, Select Satellite in Receiver, Perform Antenna Setting in Receiver, Perform Scanning and Make Channels Groups</p>	<p>LU1: Select Input Mode for Display</p> <p>LU2: Select Satellite in Receiver</p> <p>LU3: Perform Antenna Setting in Receiver</p> <p>LU4: Perform Scanning</p> <p>LU5: Make Channels Groups</p>	<p>150 hours</p>

Frequently Asked Questions

<p>1. What is Competency Based Training (CBT) and how is it different from currently offered trainings in institutes?</p>	<p>Competency-based training (CBT) is an approach to vocational education and training that places emphasis on what a person can do in the workplace as a result of completing a program of training. Compared to conventional programs, the competency based training is not primarily content based; it rather focuses on the competence requirement of the envisaged job role. The whole qualification refers to certain industry standard criterion and is modularized in nature rather than being course oriented.</p>
<p>2. What is the passing criterion for CBT certificate?</p>	<p>You shall be required to be declared “Competent” in the summative assessment to attain the certificate.</p>
<p>3. What are the entry requirements for this course?</p>	<p>The entry requirement for this course is as follow.</p> <ul style="list-style-type: none"> • Middle (Grade 8) for level-1 • Level-1 for level-2 • Level-2 for level-3 • Level-3 for level-4
<p>4. How can I progress in my educational career after attaining this certificate?</p>	<p>You shall be able to progress further to National Vocational Certificate Level-4 in satellite Dish Installer; and take admission in a level-5, DAE or equivalent course. In certain case, you may be required to attain an equivalence certificate from The Inter Board Committee of Chairmen (IBCC).</p>
<p>5. If I have the experience and skills mentioned in the competency standards, do I still need to attend the course to attain this certificate?</p>	<p>You can opt to take part in the Recognition of Prior Learning (RPL) program by contacting the relevant training institute and getting assessed by providing the required evidences.</p>

6. What is the entry requirement for Recognition of Prior Learning program (RPL)?	There is no general entry requirement. The institute shall assess you, identify your competence gaps and offer you courses to cover the gaps; after which you can take up the final assessment.
7. Is there any age restriction for entry in this course or Recognition of Prior Learning program (RPL)?	There are no age restrictions to enter this course or take up the Recognition of Prior Learning program
8. What is the duration of this course?	The duration of the course work is
9. What are the class timings?	The classes are normally offered 25 days a month from 08:00am to 01:30pm. These may vary according to the practices of certain institutes.
10. What is equivalence of this certificate with other qualifications?	As per the national vocational qualifications framework, the level-4 certificate is equivalent to Matriculation. The criteria for equivalence and equivalence certificate can be obtained from The Inter Board Committee of Chairmen (IBCC).
11. What is the importance of this certificate in National and International job market?	This certificate is based on the nationally standardized and notified competency standards by National Vocational and Technical Training Commission (NAVTTTC). These standards are also recognized worldwide as all the standards are coded using international methodology and are accessible to the employers worldwide through NAVTTTC website.
12. Which jobs can I get after attaining this certificate? Are there job for this certificate in public sector as well?	<p>You shall be able to take up jobs in the Satellite Dish Installation industry with the following designations</p> <ul style="list-style-type: none"> • Domestic Satellite Dish Installer • Industrial Satellite Dish Installer • Satellite dish Technician • Satellite dish supervisor • Satellite installation technician • Satellite dish Trainer • Cable distributor,

	<ul style="list-style-type: none"> • Internet Service Provider • TV Network distributor, • TV Technician • work in Telecommunication.
13. What are possible career progressions in industry after attaining this certificate?	You shall be able to progress up to the level of supervisor after attaining sufficient experience, knowledge and skills during the job. Attaining additional relevant qualifications may aid your career advancement to even higher levels.
14. Is this certificate recognized by any competent authority in Pakistan?	This certificate is based on the nationally standardized and notified competency standards by National Vocational and Technical Training Commission (NAVTTTC). The official certificates shall be awarded by the relevant certificate awarding body.
15. Is on-the-job training mandatory for this certificate? If yes, what is the duration of on-the-job training?	On-the-job training is not a requirement for final / summative assessment of this certificate. However, taking up on-the-job training after or during the course work may add your chances to get a job afterwards.
16. How much salary can I get on job after attaining this certificate?	The minimum wages announced by the Government of Pakistan in 2019 are PKR 17,500. This may vary in subsequent years and different regions of the country. Progressive employers may pay more than the mentioned amount.
17. Are there any alternative certificates which I can take up?	There are some short courses offered by some training institutes on this subject. Some institutes may still be offering conventional certificate courses in the field.
18. What is the teaching language of this course?	The teaching language of this course is Urdu and English.
19. Is it possible to switch to other certificate programs during the course?	Partially no, but if you have covered the Generic and functional competencies of this course and you want to switch to other certificate or want to enroll in other course, then you will take exemptions from the generic and functional competencies of the same level.
20. What is the examination / assessment system in this program?	Competency based assessments are organized by training institutes during the course which serve the purpose of assessing the progress and preparedness of each student. Final /

	summative assessments are organized by the relevant qualification awarding bodies at the end of the certificate program. You shall be required to be declared "Competent" in the summative assessment to attain the certificate.
21. Does this certificate enable me to work as freelancer?	Yes! You can start your small business of Installation of satellite dish or other telecom equipment. You may need additional skills on entrepreneurship to support your initiative.

Test Yourself (Multiple Choice Questions)

MODULE 5

Question 1 A stage in transponder and downlink system which amplifies the signal and ensuring that noise is suppressed as possible

- A Mixer
- B Demodulator
- C LNA
- D IF amplifier

Question 2 Satellite-to-satellite link is also called_____, it improves overall communication effecincy

- A Uplink
- B Downlink
- C Crosslink
- D Weakest link

Question 3 The expression for satellite link frequencies such as 14/12 GHz denotes that

- A 12 GHz is the uplink frequency and 14 GHz is the downlink frequency
- B the system is operating at a mean frequency of 13 GHz
- C 14 GHz is the uplink frequency and 12 GHz is the downlink frequency
- D the 14 GHz frequency is backup for 12 GHz frequency or vice versa

Question 4 A satellite equipped with electronic devices to receive, amplify, convert, and retransmit signals.

- A Passive
- B Active
- C Uplink
- D Downlink

Question 5 _____ detects the satellite signal relayed from the feed and converts it to an electric current, amplifies and lower its frequency.

- A Feedhorn
- B Satellite dish
- C Satellite receiver
- D LNA

MODULE 6

Question 6 Satellites used for intercontinental communications are known as

- A Comsat
- B Domsat
- C Marisat
- D Intelsat

Question 7 A satellite signal transmitted from a satellite transponder to earth's station.

A Uplink

B Downlink

C Terrestrial

D Earthbound

Question 8 Collects very weak signals from a broadcast satellite and designed to transmit and receive radio signals.

A Helical Antenna

B Satellite Dish

C LNA

D TWT

Question 9 The frequency of Ku band for satellite communications

- A 6/4 GHz
- B 14/11 GHz
- C 12/14 GHz
- D 4/8 GHz

Question 10 AsiaSat 1 was a communication satellite launched mainly for radio communication, The location of AsiaSat I was_____.

- A 105.5° East
- B 151.5° East
- C 115.5° East
- D 170.5° East

