BUILDING ELECTRICAL INSTALLATIONLEVEL II

Learning Guide-38

Unit of Competence: Assemble and install reception antennae and signal Distribution Equipment

Module Title: Assembling and install reception antennae and signal Distribution Equipment

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LO 1: Prepare to install and set-up reception antennae and signal distribution systems

Instruction Sheet-1	Prepare to install and set-up reception antennae and signal distribution system

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- Identifying OHS procedures for a given work area.
- Measuring OHS risk controls are following in preparation for the work
- Identifying Safety hazards, risk control measures, reported and advise are sought from the work supervisor
- Obtaining the nature and location form the work supervisor.
- Advising is sought from the work supervisor and/or other appropriate person
- Requiring the Sources of materials in accordance with established routines
- obtaining and checking for correct operation and safety Tools, equipment and testing devices

This guide will also assist you to attain the learning outcome stated in the cover page.
Specifically, **upon completion of this Learning Guide, you will be able to**:

- Identify OHS procedures for a given work area.
- measures OHS risk control are following in preparation for the work
- Identify Safety hazards, risk control measures, reported and advise are sought from the work supervisor
- Obtain the nature and locations form the work supervisor.
- Advise is sought from the work supervisor and/or other appropriate person
- Require the Sources of materials in accordance with established routines
- obtain and checking for correct operation and safety Tools, equipment and testing devices

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks". Each information sheets.
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets and LAP Tests if any”. However, if your rating is unsatisfactory, ask your teacher for further instructions or go back to Learning Activity.
7. After you accomplish Operation sheets and LAP Tests, ensure you have a formative assessment and get a satisfactory result;
8. Then proceed to the next information sheet.

Information Sheet-1	Identifying OHS procedures for a given work area

1.1 Identify OH&S procedure

OHS Policies and Procedures are a major part of protecting the safety, health and welfare of people engaged in work or employment. Having a clear set of OHS Policies and Procedures will make it clear to all concerned where the guidelines and boundaries are in relation to the operation of the business.

1.1.1 Reception Antenna

It would be best to have your antenna placed 30 feet above ground level to give you the clearest over-the-air connection with a tower. For those looking for that height, outdoor antennas are usually a good place to start. You'll want an amplified antenna if you're 30 or more miles away from your local broadcast tower.

It depends a little bit on your application, but in very general terms: For reception, more antenna gain means more power output from the antenna, assuming the antenna points to the transmitter. More antenna gain also means more directivity, so a better suppression of unwanted signals from other direction.

1.1.2 Safe Work Method Statement (SWMS)

- The SWMS tool has been developed to assess and control the risks of construction work that may impact the health and safety of staff, students, visitors and contractors.
- People assessing construction work may use the SWMS tool instead of the Risk Management Program.
- Following completion, the SWMS must be checked by a supervisor/ contractor responsible. Person prior to commencing the project.
- The MTLD training course calendar and course enrolment form is available at Responsibility for Implementation Responsibilities and Committees Procedure.

A summary of the specific responsibilities relevant to OHS risk management: responsible for ensuring that a risk-based approach is adopted for the management of OHS.

• Academic/administrative units are responsible for ensuring SARAH is utilized for the of all Risk Assessments in their areas.

1.2. OHS committees:

• OHS committees are responsible for oversight of the OHS risk management process.

• Unless there is a separate review committee, OHS committees are responsible for review in any risk assessments that have a residual risk of high.

1.3. Obtain and understood through establish routine

General electrical safety in work place

A. Any electrical equipment found to be unsafe in the workplace must be immediately disconnected

(isolated) from the power supply and tagged out, see Plant information, out of service, isolation and lockout tags) and not placed back into service until the equipment is repaired, tested and found to be safe or the equipment is replaced.

B. Equipment must be used only as intended by the manufacturer (see Plant Safety Procedures).

Repaired or serviced equipment

any electrical equipment returned to service after repair or servicing that could have affected the electrical safety of the equipment must be inspected, tested and tagged before use.

General Working on Electrical Equipment and Systems

Electrical installations must comply with the applicable provisions of the current editions of the National Electrical Safety Code, National Electrical Code, OSHA Regulations, and the Reclamation Safety and Health Standards. The Underwriters Laboratories, Factory Mutual Laboratories, or other nationally recognized testing laboratory must approve or list electrical wire, conduit, apparatus, power tools and equipment, for the specific application. This approval/listing must appear on each piece of equipment or tool as part of the "marking or labeling" required below.

Self-Check -1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. One of the following is PPE(5 points)

A. Laboratory coat C. Hearing protection

B. Safety glass D. all

2. The SWMS tools has been developed to asses and control the risk of construction work may impact the health and safety of staff student visitors and contractors

A. False B. True

3._____are responsible for over sight of the OHS risk management process

A. Manager B.OHS committee

C .supervisor D.A&B

4. Any electrical equipment found to be unsafe in the work place must be immediately disconnected or isolated

A. True B. False

Note: **Satisfactory rating - 3 and 5 points Unsatisfactory - below 3 and 5 points**

You can ask you teacher for the copy of the correct answers.

Information Sheet- 2	Following OHS risk control measures in preparation for the work

2.1 Establish OHS risk control measure

2.1.1. Risk Control

Taking actions to eliminate health and safety risks so far as is reasonably practicable. Where risks cannot be eliminated, then implementation of control measures is required, to minimize risks so far as is reasonably practicable. A hierarchy of controls has been developed and is described below to assist in selection of the most appropriate risk control measure/s. Monitoring and Review: This involves ongoing monitoring of the hazards identified, risks assessed and risk control processes and reviewing them to make sure they are working effectively

- **Risk Assessment:**

Is defined as the process of assessing the risks associated with each of the hazards identified so the nature of the risk can be understood. This includes the nature of the harm that may result from the hazard, the severity of that harm and the likelihood of this occurring.

- **Responsibilities Effective risk management:** requires the commitment to WHS from managers and Officer as well as the input and involvement of workers. It is the responsibility of all managers and supervisors to ensure that this policy is fully implemented in their area(s) of control and to consult with workers as part of undertaking the hazard identification, risk assessment and control process. It is the responsibility of workers to cooperate and comply with this policy. This includes providing effective and constructive information and feedback to aid the risk management process. Officers have a responsibility to ensure that the areas under their control are complying with legislative requirements. This includes the Officer

understanding the hazards and risks associated with their operations and ensuring that appropriate resources and processes are in place to eliminate or minimize these risks.

2.1.2 Risk Assessment Procedure The risk assessment procedure can best be illustrated in the following way.

Assess Risks Risk assessment involves considering the possible results of someone being exposed to a hazard and the likelihood of this occurring. A risk assessment assists in determining: - How severe a risk is - Whether existing control measures are effective - What action should be taken to control a risk - How urgently action needs to be taken. A risk assessment should include:

- Identify factors that may be contributing to the risk,
- Review health and safety information that is reasonably available from an authoritative source and is relevant to the particular hazard,
- Evaluation of how severe the harm could be. This includes looking at the types of injuries/illnesses/harm/damage that can result from the hazard, the number of people exposed, possible chain effects from exposure to this hazard.
- Evaluation of how a hazard may cause harm. This includes examining how work is completed, whether existing control measures are in place and whether they control the harm, looking at infrequent/abnormal situations as well as standard operating situations. A chain of events related to a risk may need to be considered.
- Determining the likelihood of harm occurring. The level of risk will increase as the likelihood of harm and its severity increases. The likelihood of harm occurring may be affected by how often the task is completed, in what conditions, how many people are exposed to the hazard and for what duration.
- Identify the actions necessary to eliminate or control the risk; and

Identify records that it is necessary to keep to ensure that the risks are eliminated or controlled. Other risk factors should also be identified as they may contribute to the risk: including

- The work premises and the working environment, including their layout and condition,
- The capability, skill, experience and age of people ordinarily undertaking work,
- The systems of work being used
- .The range of reasonably foreseeable conditions. The process of assessing the risk is undertaken by reviewing any available information about the hazard (e.g. legislation, Australian Standards, Industry Code of Practice or guidance material about the hazard) and by using your personal work experience about what sort harm the hazard could create and how likely this would be to happen.
- **Exposure factors of risk control**
  - ✓ Whether there are any other risk factors that increase the likelihood of exposure? (ii). How often is the person exposed (frequency)?
  - ✓ How long the person is exposed (duration)?
  - ✓ How many people are exposed?
  - ✓ The likely dose to which the person is exposed?
  - ✓ Any legislative or recommended exposure levels required by statutory authorities. At Western Sydney University we require managers and supervisors to identify hazards, assess the risks of harm resulting from exposure to the hazards and set a priority for corrective action by using a clearly laid out process.

- **The hierarchy of risk control is to be applied as follows**:

Elimination: change the work practices so that electrical equipment is no longer required to be used. Where elimination is not reasonably practicable the following control measures

Substitution: replace corded electrical equipment with cordless equipment to minimize the risk of electrocution during operation be implemented

Engineering Control – install Residual Current Devices (RCDs) to reduce the risk of electric shock

Administration -develops Safe Work Method Statement (SWMS) and provides. Instruction and training in safe work methods and use of equipment

Elimination	Regulations supporting the OHS Act require the elimination of risks as the first step in risk control.
Substitution	Substitution of a less hazardous alternative.
Isolation	Enclosing or isolating the hazard.
Engineering Controls	Changing processes, equipment or tools e.g.: • Machinery guards • Ventilation • Mechanical aids
Administrative Controls	Information, training and procedures e.g.: • Job rotation • Limiting access • Permit systems • Safe operating procedures • Training

	• Signage
Personal Protective Equipment	Laboratory coat, safety glasses, closed shoes/boots, hearing protection

Review of Risk Assessment

• The effectiveness of the controls must be evaluated to determine if they are achieving an acceptable level of risk.

• Until the acceptable level of risk is achieved, the process should be reviewed regularly.

• Once the acceptable level of risk is achieved, the risk assessments should only be reviewed when:

• There is a significant change;

•A hazard and incident report is entered relating to the process; or

• Three years have elapsed since the last review.

Self-Check -2	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. _____ is the process of assessing the risk associated with each of the hazards (3 points)

   A. Risk control C. Risk assessment

   B. Effectiveness D. A and B

2._____ Hierarchy of risk control includes. (3 points)

   B. Elimination C. Substitution

   C. Isolation & engineering control D. all

Note: **Satisfactory rating - 3 points Unsatisfactory - below 3 points**

You can ask you teacher for the copy of the correct answers.

Information Sheet-3	Identifying Safety hazards, risk control measures, reported and advise are sought from the work supervisor

3.1. Concepts safety hazards(Identify safety hazards)

- **Definitions Hazard:**

Anything (e.g. condition, situation, practice, behavior) that has the potential to cause harm, including injury, disease, death, environmental, property and equipment damage. A hazard can be a thing or a situation.

- **Hazard Identification:**

This is the process of examining each work area and work task for the purpose of identifying all the hazards which are “inherent in the job”. Work areas include but are not limited to machine workshops, laboratories, office areas, agricultural and horticultural environments, stores and transport, maintenance and grounds, reprographics, and lecture theatres and teaching spaces. Tasks can include (but may not be limited to) using screen based equipment, audio and visual equipment, industrial equipment, hazardous substances and/or teaching/dealing with people, driving a vehicle, dealing with emergency situations, construction. This process is about finding what could cause harm in work task or area. Risk: The likelihood, or possibility, that harm (injury, illness, death, damage etc) may occur from exposure to a hazard

Identify Hazards in consultation with workers identify all potentially hazardous things or situations that may cause harm. In general, hazards are likely to be found in the following; - Physical work environment, - Equipment, materials or substances used, - Work tasks and how they are performed, - Work design and management In order to identify hazards the following are recommended:

(i) Past incidents/accidents are examined to see what happened and whether the incident/accident could occur again.

(ii) Employees be consulted to find out what they consider are safety issues, I.e. ask workers about hazards near misses they have encountered as part of their work. Sometimes a survey or questionnaire can assist workers to provide information about workplace hazards.

(iii) Work areas or work sites be inspected or examined to find out what is happening now. Identified hazards should be documented to allow further action. The work environment, tool and equipment as well as tasks and procedures should be examined for risks

(iv) Information about equipment (e.g. plant, operating instructions) and Material Safety Data Sheets is reviewed to determine relevant safety precautions.

(v) Welcome creative thinking about what could go wrong takes place, i.e. what hazardous event could take place here? At the University, any hazard which is identified by this process should be recorded on the Risk Assessment and Control Sheet (see Attachment 1 to this document) and further action taken to assess and then control the risks from this hazard

3.2. Risk control measures

Level 1 Control Measures – Eliminate the Hazard The most effective control measures eliminate the hazard and associated risks. This can be achieved through removing the hazard or selecting alternate products or equipment to eliminate the risk. If a hazard cannot be eliminated then risks can be minimized by lower control measures

Level 2 Control Measures- These are used to minimize the risks and involve on or a combination of the following;

(i). Substitute the hazard: substitute a substance, method or material to reduce the risk or the hazard

(ii).isolate the hazard: separate the hazard from the workplace or people, For example

a. Chemical store room, or a laboratory kept locked except to an authorized person.

b. Lock out procedures on faulty equipment.

c. Appropriate guarding for machinery.

(iii). Use engineering controls: modify existing machinery or plant or purchase different machinery or plant to provide a physical solution. For example; a. Trolleys, hoists or cranes. b. Guard rails.

(iv). Administrative Procedures: develop work methods or procedures to reduce the conditions of risk, for example:

a. Written Safe Operating Procedures

b. Job rotation to restrict hours worked on difficult jobs.

c. Staff trained in the correct operating procedures.

(v). Use Personal Protective Equipment (PPE) and training in its use: offer the lowest level of protection and should only be used as a last resort to deal with the hazard, where the hazard cannot be removed or reduced by any other means, for example:

A. handling of chemicals – gloves, safety glasses, aprons.

B. Protecting eyes from flying particles.

C. Protecting feet – safety boots. Consultation with workers is required in the selection and implementation of control measure in the workplace. Controls may need to be trailed to determine effectiveness and workers should be involved in the feedback process. Each

measure must have a designated person and date assigned for the implementation of controls. This ensures that all required safety measures will be completed and documented.

Level 3 Control Measures-These are control options which should be considered last as they do not control the source of the hazard but rely on human behavior or supervision and are therefore less effective.

Self-Check -3	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. _____ can be achieved through removing the hazard or selecting alternate products or equipment to eliminate. (**3 points**)

   A. Level 2 Control Measures C. Level 3 Control Measures

   B .Level 1 Control Measures D. Risk control

2. _____is the process of examining each work area and work task for the purpose of identifying all the hazards which are “inherent in the job”.(**4 points**)

   A. Hazard Identification C.OHS procedure

   B. Risk control Measure D. All

Note: **Satisfactory rating –3 and 4 points Unsatisfactory - below 3 and 4 points**

You can ask you teacher for the copy of the correct answers.

Information Sheet-4	Obtaining the nature and location form the work supervisor

4.1. The nature of the work in antennae installation obtained from work supervisor

The information in this manual has been gather antenna installation p red from some of the most experienced professionals in the country and compiled by Channel Master Field engineers. It is intended for technicians who are, or plan to become professional antenna installers. Any handy “do-it-yourself” consumer can mount an antenna, run transmission line and pull in some kind of a signal. But only a professional can select and precisely install the correct antenna and assure his customers years of superior TV/FM reception

Back in the 1940s, TV antennas were actually manufactured by hand at the installation site. Each antenna was assembled, p customer’s home. Channel Master eliminated this piece by piece, at the time-consuming labor by introducing the first preassembled TV antenna, providing excellent reception in all areas and at reasonable prices

Today medium-to-high gain, broadband antennas are essential for good reception. Even the most expensive color TV or FM stereo receiver can’t perform to full potential without the strong signals that only quality antenna system can provide. Advanced antenna theory and design is not included time-tested methods and procedures for properly installing TV and FM antennas. With this foundation of knowledge, you can build your reputation as a professional antenna installer–one who is capable of assuring his customers the finest performance from today’s sophisticated TV and FM equipment

4.2. The location of the work is obtained from work supervisor

4.2.1 Directivity

Directivity is the ability of an antenna to intercept signals from only one direction and reject those from other directions. Directivity indicates the antenna’s ability to intercept signals arriving at its front and reject signals coming from the sides and rear. Generally, the more highly directive an antenna, the better it can reject signals from the sides and rear.

The front-to-back ratio of an antenna can be helpful when attempting to determine its directivity Front-to-back ratio is expressed in decibels (dB) and can be found in the literature accompanying a new antenna. This ratio indicates an antenna’s ability to reject signals coming

from the rear (rear rejection). For example, an antenna with a front-to-back ratio of25 dB will receive about 18 times more signal strength. From the front than from the back in most cases, an acceptably accurate estimate of an antenna's directivity can be made by comparing its specified front-to-back ratio with the relative sensitivity classifications listed in Table 4-1. The sensitivity classifications in Table 4-1 are intended only as general guidelines for evaluating directivity. Other factors, such as the antenna's beam width, can affect its directivity. Beam width is related to an if two antennas have the same front-to-back ratio, the one with the highest overall gain will have the narrowest beam width and consequently, will be the most directive.

Area Designation	For VHF	For UHF
Deepest Fringe	100+ miles	60+ miles
Deep Fringe	100 miles	60 miles
Fringe	80 miles	45 miles
Near Fringe	60 miles	35 miles
Far Suburban	50 miles	35 miles
Suburban	45 miles	30 miles
Far Metropolitan	30 miles	25 miles
Metropolitan	25 miles	15 miles

Tale 4.1 Typically sensitive classification

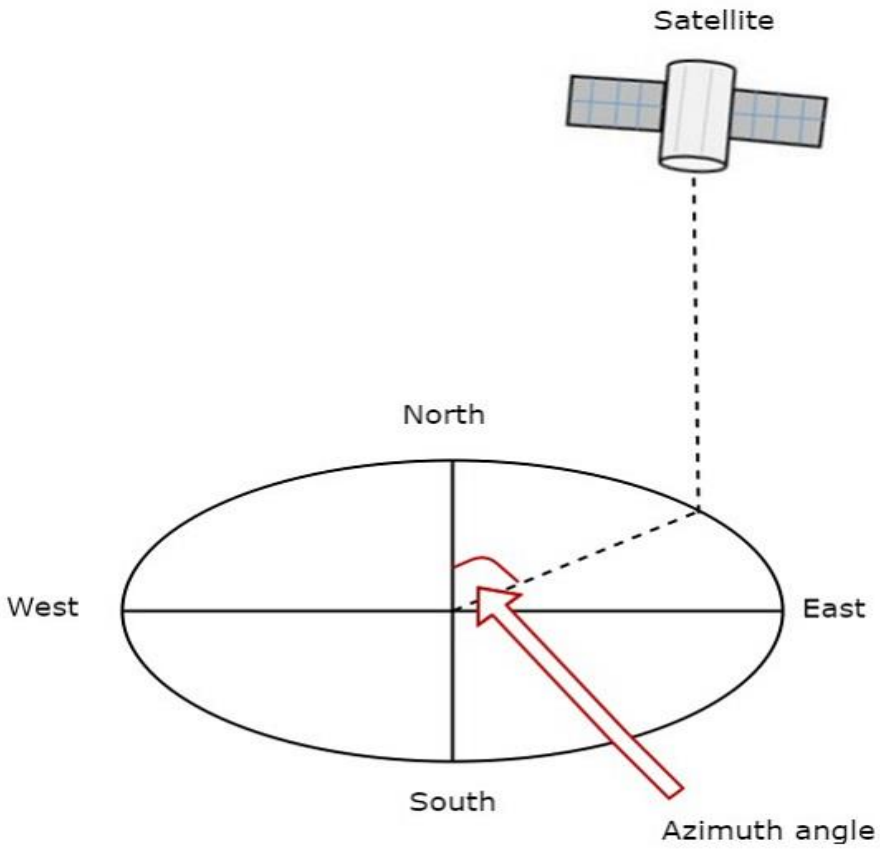

Fig.4.1 Location of antenna

4.2.2 Strength of signal

Ideally an antenna should be mounted at the point where the signals are the strongest through of this is impractical or impossible also the antenna should be mounted where it can be easily serviced should repairs or adjustments be required in the future. So carefully “aiming” (orienting) the antenna and adjusting its height often can overcome the problems created by installing it in a slightly weaker signal area in an area where there is a relatively short, unobstructed signal path between the installation and the transmitting towers, you can mount the antenna just about anywhere and receive sufficient signal. As you move deeper into the fringe areas however, there may be significant differences in signal strength at various points

on the roof. This is where careful antenna selection, precise orienting, and accurate adjustment of the height become essential. The careful installer should be able to

Large trees can present reception problems and nearby high-voltage power lines can cause interference that cannot be completely eliminated. Consequently, the further the antenna is from large trees and high-voltage Lines, the better the reception will be locate a spot where there is both a usable signal

4.2.3 WALKING THE ROOF FOR OPTIMUM SIGNAL STRENGTH

Walking the roof" is usually the best way to find the spot on the roof where the strongest signals are present. First, attach a small TV antenna to short mast (4-6 feet). Attach one end of a short transmission line to the antenna terminals. Attach the other end of the transmission line to the input jack of a field-strength meter. Then walk to the most suitable mounting areas. Point the front of the test antenna in

the general direction of the transmitter tower(s). Slowly, rotate the antenna while carefully watching the field-strength meter. (Most field strength meters are equipped with shoulder straps that free both of your hands for manipulating the antenna.)

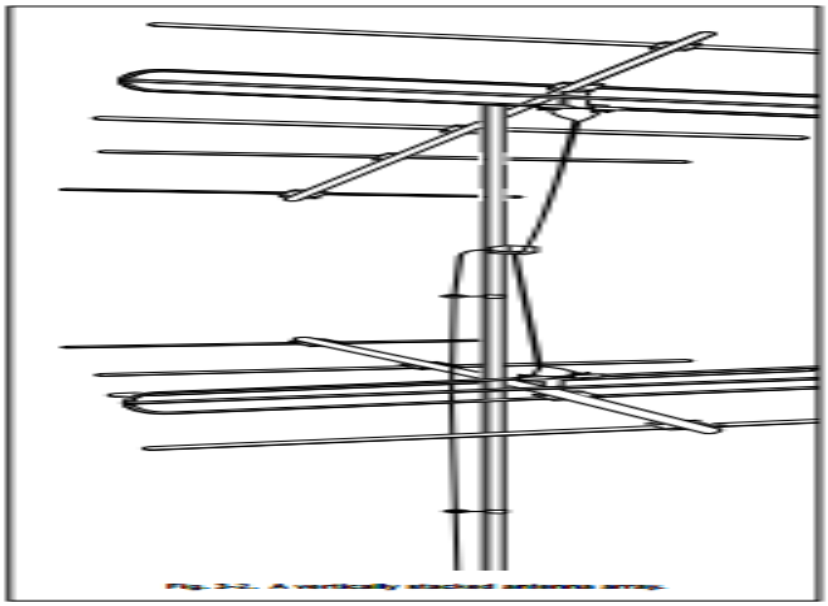

Fig 4.2.Roof antenna

➢ USING A FIELD-STRENGTH METER

A small, battery-powered portable TV is helpful for determining general reception quality. However, there is no better way to determine actual signal strength than to use a field-strength meter it is one of the best investments you can make. The meter will save you so much time and trouble that it will quickly pay for itself

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Self-Check -4	Written Test

Directions: Answer all the questions listed below. (Choose the best answer)

1. _____ is the ability of an antenna to intercept signals from only one direction and reject those from other directions. (3 points)

A. Directivity
C. Signal distribution
B. Signal strength
D. Gathering information

2._____ is usually the best way to find the spot on the roof where the strongest signals are present.

A. Walking the roof
C .Field strength meter
B. Directivity
D. All

Note: **Satisfactory rating –3 points** **Unsatisfactory - below 3 and 4 points**

You can ask you teacher for the copy of the correct answers.

Information Sheet-5	Advising is sought from the work supervisor and/or other appropriate person

5.1 Introduction to Work supervisor

During gathering information relating to the extent of local resource and their providers, renewing and updating information at the office level is important for making right decisions. Accordingly, right decisions are depending of quality of reviewing information.

I. Renewing: is making something valid for a further period of time, emphasizing something by saying or stating it again.
II. Updating: means add/give something recent information about to something.

In short, renewing and updating information is the process of reviewing or checking the collected information that is during the interpretation and analysis step. This indicates the value of support, supervision and monitoring to own work by any responsible body. This can be also done at individual level given there are guiding objectives in the initial phase.

5.2Supervisors:

- Supervisors are responsible for controlling the OHS risks associated with the work or study that they supervise. Supervisors are responsible for authorizing risk assessments for those under their supervision.
- Supervisors are responsible for ensuring that the staff or students they supervise have received appropriate training and have gained sufficient competence to undertake the task.
- Supervisors can delegate the supervision or training of a staff member or student to a suitably qualified and/or experienced person, as appropriate for the task.

5.3APPROVED PRODUCTS AND MATERIALS

Products used in home remodeling projects must be listed by a nationally recognized independent agency. Agency listings include fire rated assemblies, prefabricated fireplaces and stoves, Finders, Coaxial cable, etc. When you have identified a specific brand and model you want to install, check with your District Inspector to see if it has been approved for use in the City and County of Ethiopia. In most cases, the brand and listing must be shown on the plans to be approved.

Self-Check -3	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

3. _____ are responsible for authorizing risk assessments for those under their supervision.. (**3 points**)

   D. Supervisor C. Mangers

   E. Interpreting information D. Gathering information

4. List out the sources of additional information gathering.(**4 points**)

Note: **Satisfactory rating –3 and 4 points** **Unsatisfactory - below 3 and 4 points**

You can ask you teacher for the copy of the correct answers.

Information Sheet-6	Requiring the Sources of materials in accordance with established routines

6.1. Sources of materials that may be required for antennae installation work

6.1.1 Concepts of local resources

The term local resources (or community resources similar term) are assets in a community that help meet certain needs for those around them.

6.1.2 Types of local resources

The type of these local resources can be;

- It can be a **person-** Residents can be empowered to realize and use their abilities to build and transform the community.
- It can be a **physical structure or place**- a school, hospital, church, library, recreation center, and social club. It could be a town landmark or symbol. It might also be an unused building that could house a community hospice, or a second floor room ideal for community meetings. Or it might be a public place that already belongs to the community -- a park, a wetland, or other open space.
- It can be a **community service-** that makes life better for some or all community members - public transportation, early childhood education center, community recycling facilities, cultural organization.
- It can be a **business**- that provides jobs and supports the local economy.

6.1.3 Importance of Local Resources

Using local resources are necessary in any socio-economic developmental work/activities since

- Introduces the client to typical and new experiences
- Create opportunities client's to expose new routines
- Engage client's talents in solving their social, cultural, and intellectual pursuits.
- Use for improvements
- Enables community residents to gain control over their lives.

Maintain the communities/clients' efforts more effective, and longer-lasting.

Electrical hand tools (pliers, screwdrivers, wrenched, wire splices, knives)

Testing instruments (multi-tester, mugger, high potential tester, earth resistance tester)

Labeling machine, ladders etc.

The planned locations are checked for their sensitivity, visually acceptable and are in accordance with other site services

6.2 Types of service/local resources providers

Most of the time the providers of local services/resources are;

- **Government:** Government is a group of people that governs a community or unit. It sets and administers public policy and exercises executive, political and sovereign power through customs, institutions, and laws within a state. A government can be classified into many types--democracy, republic, monarchy, aristocracy, and dictatorship are just a few.
- **Non-Governmental:** The term Non-Governmental includes a variety of organizations such as "private voluntary organizations," "civil society organizations," and "nonprofit organization" generally and charity organizations, local elders, the people in the community, religious institutions and local community leaders specifically.

  Most of these nongovernmental organizations participated actively in different activities such as;

  - community health promotion and education
  - managing emerging health crises, environmental issues i.e. sustainable water and energy resources
  - economic empowerment i.e. micro loans, skills training, financial education
  - development projects i.e. school and infrastructure construction
  - Women and children's rights

6.3 Timeframe for mobilizing local resources

The time for mobilizing local resources is needed;

I. Every day

II. Under different conditions/situations when it is especial desirable to do so like;

- ✓ When conducting a community assessment and need to find assets to mobilize to address community needs.
- ✓ When the community includes talented and experienced citizens whose skills are valuable but underutilized.
- ✓ When the traditional services can't provide, even if wanted to, and are looking for other ways to build up the community.
- ✓ When someone want to encourage residents to take pride in and responsibility for local concerns and improvements.
- ✓ When someone wants to strengthen existing relationships and build new ones that will promote successful community development in the future.

➢ **Directly imported equipment**

a. imported equipment must only be purchased directly from overseas when suitable equipment is not available from an Australian supplier.

b. Any electrical items imported directly from overseas must be safe to use in the workplace

c. Any electrical equipment purchased directly from overseas must be inspected, tested and tagged by a licensed electrician (as per part a. of the definition of competent person) or electrical/electronic technician as defined at part before it is placed in the workplace and allowed to be used.

d. Where electrical equipment has motors fitted, the equipment must be fitted with electrical isolators and tested to ensure energy sources are able to be isolated.

➢ **Second-hand electrical equipment**

a. Any second-hand electrical equipment must be inspected, tested and tagged by a

licensed electrician or electrical/electronic technician before it is placed in the workplace and allowed to be used.

b. Where available, wiring and maintenance documentation, including any modifications made to the equipment (e.g. upgraded wiring diagrams), must be acquired at the time of purchase

Self-Check -3	Written Test

Directions: Answer all the questions listed below.

5. Any electrical items imported directly from overseas must be safe to use in the workplace (**3 points**)

A. Second-hand electrical equipment

B. Directly imported equipment

C. A and B

D. All

6. that provides jobs and supports the local economy.(**4 points**)

A. community service

B. physical structure or place

C. business

D. All

Note: **Satisfactory rating –3 and 4 points** **Unsatisfactory - below 3 and 4 points**

You can ask you teacher for the copy of the correct answers.

Information Sheet-7	obtaining and checking Tools, equipment and testing devices to carry out the work

7.1. Tools, equipment and testing devices needed to carry out the work for antenna

7.1.1 Tools and equipment

Use of tools identification and application of tools for making out measuring, cutting, shaping, drilling, threading, tapping, finishing, dismantling/assembling tools use, hazards safety procedure technique fabrication, materials types application, technique marking out bending drilling /punching soldering cutting miters assemble /disassembly techniques measuring device.

These have serrated jaws and are used for gripping, twisting and bending conductors. They also have a curved section, serrated for gripping round metal items. A wire cutter is also provided. See Figure 7.1

Fig 7.1 combination pliers

- **Knife**

A good quality electrician's penknife is mainly used to remove the sheath from the various types of cables and flexible cords.

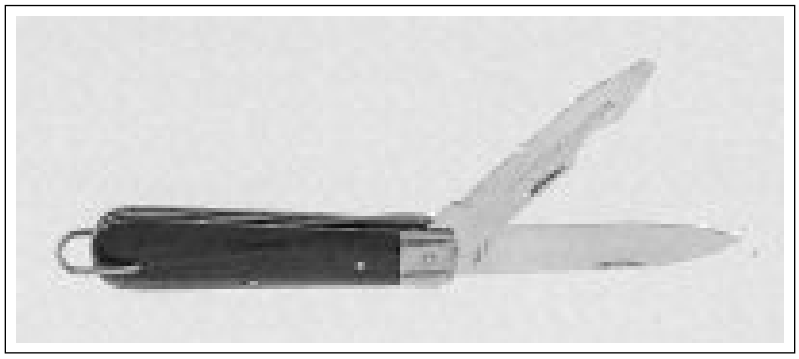


Fig 7.2

This is best done by scoring round the sheath at the point to which it must be removed. Be careful not to cut through the sheath, damaging the insulation. In some cases, the sheath can then be removed, by flexing gently at the scored point until it yields. Then pull while twisting to follow the lay of the cores. See Figure 7.2

- **Screwdrivers**

There are a wide variety of types and sizes of screwdriver, some of which have very specialized uses, e.g. tamper proof fixings.

Flat blade screwdrivers are still in common use today in the electrical trade. They are specified in size, by the length of the blade and the width of the tip. A set consisting of at least five would be suitable for electrical work.

Screwdrivers should **not** be used as chisels. Larger sizes may be used to advantage for some levering operations, but great care must be taken to avoid damage to the shaft or tip. The tip of the screwdriver should fit the screw head accurately, to achieve maximum drive and avoid damage to the screw head. See Figure 7.3

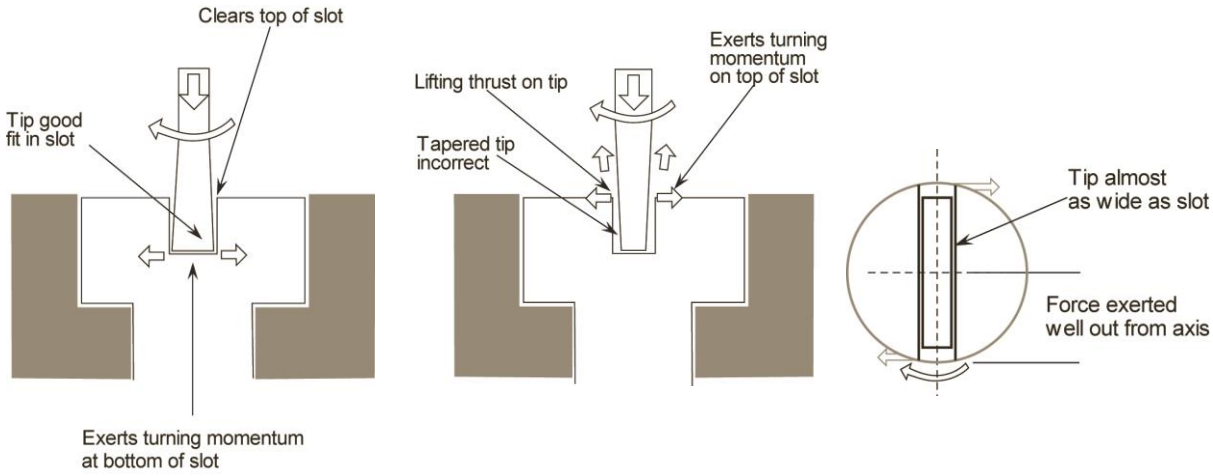


Fig 7.3 Screwdriver

- **Philips and Pozidrive Screwdrivers**

The Philips screwdriver has been in use for a long period of time. It has the advantage in that it can be very simply and quickly located in the screw head. Its main disadvantage is that it has wings, which are tapered. These tend to cause the tip of the screwdriver to be forced up out of the screw head, when a turning effort is applied.

A variation and indeed an improvement on the Philips screwdriver, is the Pozidrive type. These are very similar in appearance. The main difference between them is the fact that the Pozidrive has wings, which are parallel. These provide a better grip and do not cause the tip of the screwdriver to be forced up out of the screw head.

It is important to be able to identify which type of screw head is present and then choose the correct type of screwdriver to prevent damage to the screw head. See Figure 7.4.

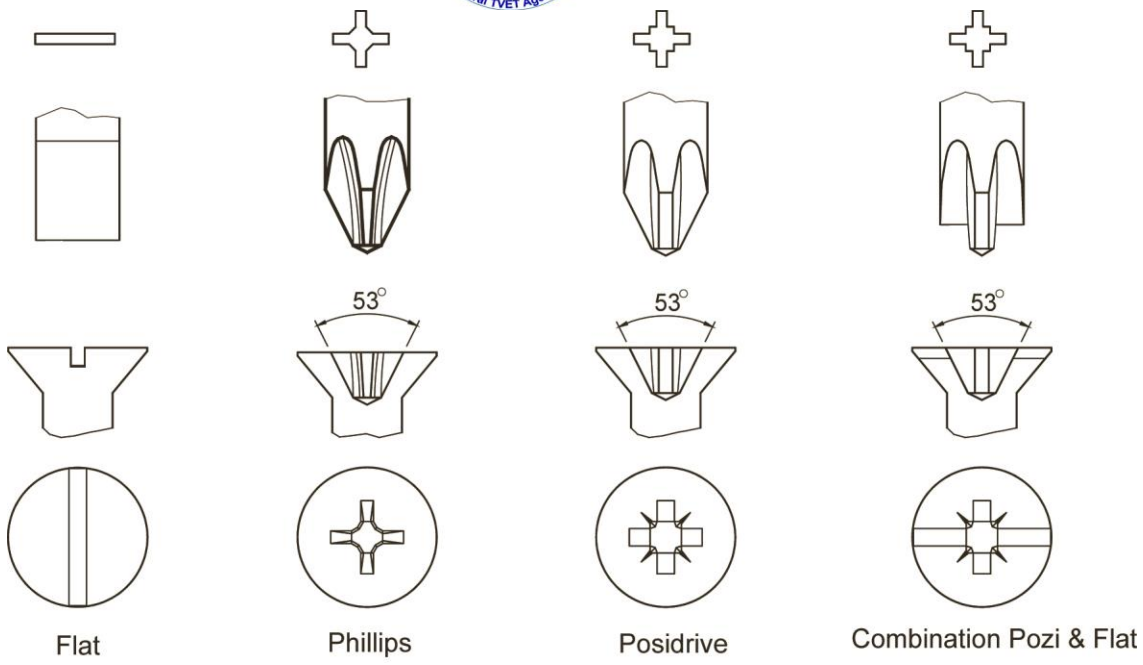


Fig 7.4 Screw head

- **Flat Blade Screwdrivers**

Figure 7.5 illustrates a set of terminal screwdrivers which are suitable for general electrical work. They have insulated shafts and tip sizes of 6, 5, 4 and 3 mm.

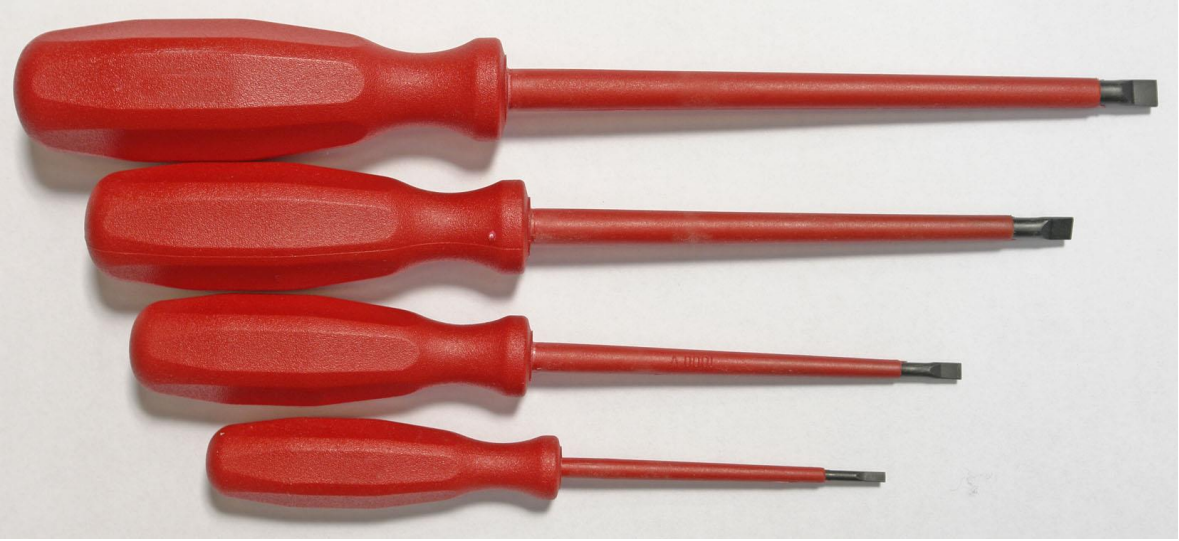


Fig 7.5 fat blade screwdrivers

- ***Positive Screwdrivers***

Figure 7.6 illustrates a size 2 and size 1 Pozidrive screwdriver. Most woodscrews now in use are pozidrive type. A Philips screwdriver will simply slip causing damage to the screw head. The same information applies to terminal screws. The length of the shaft and the tip size are marked on the handle of most screwdrivers.

Fig 7.6 positive screwdriver

- **Combination Flat and Pozi Screwdrivers**

Figure 7.7 illustrates a size 2 and a size 1 combination Flat and Pozi screwdriver. Most manufacturers of electrical protective devices are now using a screw head which will accept a Flat tip screwdriver or a Pozidrive type. This combination screwdriver provides an excellent grip and can be used numerous times without damage to the screw head.

Fig 7.7 Combination flat screw

7.1.2Tools and Materials

Elements of the installation may involve working high above the ground and should not be attempted without access to suitable safety equipment. You should:

• Be comfortable working with power tools.

• Be comfortable working on ladders and at heights.

• Be able to use a plumb line or level to set horizontal and vertical surfaces.

• Know how to drill holes in the selected mounting surface which could be brick, cinder block, wood, etc. and identify suitable fixings to suit the material for a safe secure mount.

• Know how to drill holes for the cable entering the building, fit connectors to cable, run the cables to the receive location, weather proof and seal all holes made during the installation.

• Be confident that the alignment and installation can be completed.

• Have or purchase the following items that are not supplied in the TV package:

• Coaxial cable for connection of antenna to LNB, LNB to grounding block and grounding block to TV receiver. Recommended coaxial cable: RG6.1mm conductor, swept to 3 GHz dual shield

• recommended cable clips and 75-ohm F-Type compression connectors.

• Fixings to allow the dish, grounding block, cable and antenna to be mounted to the home.

• Grounding materials as specified by the National Electric Code

• Coaxial cable ties

• Cable splitter, if needed: Only use in-line splitters that pass power on all ports and are rated from at least 5-2300

• Tools to complete the installation: compass, Phillips head screwdriver, power drill (masonry-compatible as required), correct size drill bits for fixings, level or plumb line, adjustable wrench, silicone filler for holes, cable cutters/prep tool, hammer.

7.1.2 Measuring and marking wiring systems of antenna installation

Measuring means:-

- to determine the exact dimensions, capacity, quantity, or force of; measure
- To appraise, estimate, or judge.
- To make conformable to a standard.
- To mark or measure off; delineate.
- To prepare or mix (plaster) with a definite proportion of plaster of Paris and mortar.
- To chip or rub (bricks or stones) to a uniform size or shape.

Marking is putting a point for measuring is not re measuring.

- **Satellite finder**

A satellite finder meter is a specialized device designed to help you position your satellite dish to receive the strongest signal for best television reception.It's easy to adjust your own satellite dish.

This article describes a satellite finder that we can build ourselves to assist with aligning the satellite TV dish without having to take our receiver outside. We are proposing a signal strength measurement meter which will greatly help in optimizing the dish antenna alignment precisely, once after the satellite is located.

Fig 7.1 SAT finder

- **LNB:** A low-noise block down converter (LNB) is the receiving device mounted on satellite dishes used for satellite TV reception, which collects the radio waves from the dish and converts them to a signal which is sent through a cable to the receiver inside the building.

Fig 7.2 LNB

The utilization of satellite finder is shown in figure 7.3 The low noise block (LNB) down-converter used for satellite reception (digital or analogue) does not just receive a single channel; it receives the complete range from all transponders that are operating on a particular satellite. Together with the high gain a modern LNB feeds a lot of RF energy to the receiver when the dish is correctly aligned. Our digital satellite finder measures the amount of RF energy over a wide frequency range by summing the power from all transponders and producing Received Signal Strength Indicator (RSSI) output, by means of proportionate DC voltage for display.

Fig 7.3 Satellite finder and dish configuration

Since most of the existing satellite finders are using analog scale only, and some of the satellite finders are partially digital (digital handling with analog display) and rarely available digital satellite finders are with high cost, Our innovative design explores latest technology for RF power measurement (RSSI) with digital read out, economically, and provides fruitful results to the dish TV installers.

- **Satellite Finder working procedure**

A satellite finder meter is a specialized device designed to help you position your satellite dish to receive the strongest signal for best television reception. They are simple to operate and are designed to be used while you're at the satellite dish so you don't have to check your signal strength at your television set. There are both analog and digital models available, both with and without internal power supplies.

Step 1

Connect one end of the coaxial cable to the barrel connector on the satellite dish's low noise block down converter (LNB) and the other end to the satellite finder meter. The LNB is the arm that faces the reflector dish.

Step 2

Loosen the nuts that allow the dish to be adjusted both along the horizontal (azimuth) and vertical (elevation) planes.

Step 3

Move the dish from side to side along the horizontal plane until you determine the position at which the satellite finder meter displays maximum signal strength.

If you're using an analog meter, you will find this position in increments. First, adjust the gain knob so the meter's needle reads half strength. As you move the dish closer to its optimal position, the meter may exceed maximum. If this happens, readjust the gain lower and continue to move the dish until you determine the position where maximum signal strength is received.

Step 4

Raise and lower the dish along the vertical plane until you determine the elevation at which the satellite finder meter displays maximum signal strength. If using an analog meter, you may have to adjust the gain as in the previous step.

Step 5

Tighten the nuts to lock your satellite dish into place.

Step 6

Disconnect the coaxial cable from the LNB on the satellite dish.

Personal protective equipment (PPE)

PPE includes protective eyewear, insulated gloves, hard hats, aprons and breathing protection. Most forms of PPE are not relevant to minimizing electrical risks in workplaces, except in relation to energized electrical work.

Administrative controls and PPE do nothing to change the hazard itself. They rely on people behaving as expected and require a high level of supervision. Exclusive reliance on administrative controls and PPE must only occur where other measures are not reasonably practicable or as an interim control while the preferred control measure is being implemented. You should check that your chosen control measure does not introduce new hazards.

Self-Check -7	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. _____ is Measure Current, voltage and Resistance (3 points)

   A. Ohm Meter B. Multimeter

   C. Ammeter D. Volt meters

2. _____ is used loosen and tighten (3 points)

   A. Electrical Knife B. Screw driver

   C. Multimeter D. Pliers

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

You can ask you teacher for the copy of the correct answers.

List of Reference Materials

- **https://www.youtube.com/watch?v=XOdPJDSTvjM**
- **Electrical installation designs _2nd_edition**
- **guidelines for electrical wiring in residential buildings**

BUILDING ELECTRICAL INSTALLATIONLEVEL II

Learning Guide-39

Unit of Competence: Assemble and install reception antennae and signal Distribution Equipment

Module Title: Assembling and install reception antennae and signal Distribution Equipment

LG Code: EIS BEI2 M11 LO39-LG-40

TTLM Code: EIS BEI2 M11 TTLM0919v1

LO 2: Install reception antennae and signal distribution systems

Instruction Sheet-1	Learning Guide #1

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- Measuring for carry OHS risk control out the work are followed
- Checking Circuit/components as being isolated where necessary in strict accordance OHS requirements
- Determining from signal tests and limitation for an antenna to be installed.
- Installing straight and square in the required locations and within acceptable tolerances.
- Terminating Cables and conductors
- Referring for procedure on-routine events
- Carrying out the installation efficiency without waste material

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, **upon completion of this Learning Guide, you will be able to**:

- Measure for carry OHS risk control out the work are followed
- Check Circuit/components as being isolated where necessary in strict accordance OHS requirements
- Determine from signal tests and limitation for an antenna to be installed.
- Install straight and square in the required locations and within acceptable tolerances.
- Terminate Cables and conductors
- Refer for procedure on-routine events
- Carry out the installation efficiency without waste material

Learning Instructions:

9. Read the specific objectives of this Learning Guide.
10. Follow the instructions described below
11. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
12. Accomplish the “Self-checks”. Each information sheets.
13. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
14. If you earned a satisfactory evaluation proceed to “Operation sheets and LAP Tests if any”. However, if your rating is unsatisfactory, ask your teacher for further instructions or go back to Learning Activity.
15. After you accomplish Operation sheets and LAP Tests, ensure you have a formative assessment and get a satisfactory result;
16. Then proceed to the next information sheet.

Information Sheet-1	Following the Establishment of OHS risk control measures for carrying out the work

1.1 Introduction to OH&S and risk control out the work

Occupational health and safety standards are in place to mandate the removal, reduction, or replacement of job site hazards. OHS programs should also include material that helps minimize the effects of the hazards.

❖ Risk control

- Determine what controls should be put in place to reduce the risk to an acceptable level of risk.
- The Hierarchy of control should be used as a tool to identify effective controls.
- The Hierarchy of control ranks risk control measures in decreasing order of desirability and effectiveness with the preferred control measures being elimination and substitution. The Hierarchy of control includes:
- If a risk to workplace health and safety remains after the above methods have been used administrative controls should be applied or, if these are still not adequate, personal protective clothing and equipment worn.
- These methods of risk control should be used in conjunction with other controls and are not preferred in isolation as the potential of the risk is not eliminated or reduced. OHS Risk Management Procedure, v6 Responsible Officer: Manager, OH&S

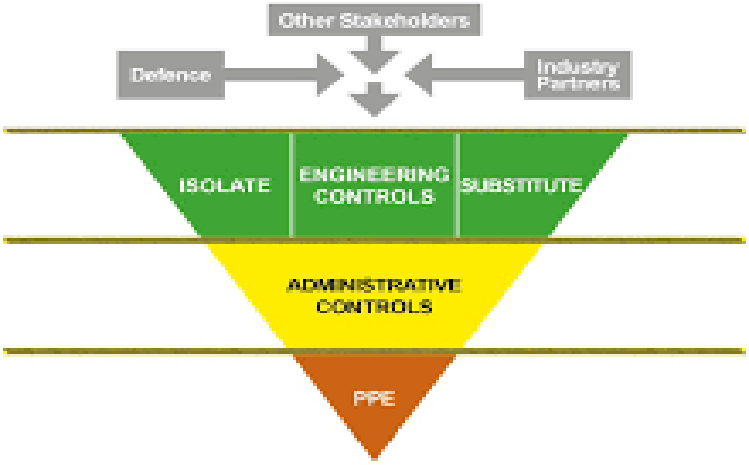


Fig 2.1 the hierarchy of Risk control measure

Self-Check -1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

_____Which one is the hierarchy of Risk control measure. (3 points)

F. Isolate C. Substitute

G. PPE D. All

3. List out the purposes of mobilizing local resources at least five points.(5 points)

Note: **Satisfactory rating - 3 and 5 points** **Unsatisfactory - below 3 and 5 points**

You can ask you teacher for the copy of the correct answers.

Information Sheet- 2	Checking Circuits/components

2.1 Checking Circuit/components of Antenna installation

- **Component of Installing a TV Antenna – A Step by Step Guide**

We are living a digital world, and everything is now digital for better performance and convenience. When we talk about the digital world, TVs are not left behind, and they have evolved from the old times of great wall TVS to the modern 3D TVs. However, one thing that we always forget to talk about is the TV antenna. It's because antenna allows you to enjoy your favorites TV program, watch the news and get entertained with your TV. Therefore, as much as we consider buying the best TV sets, you also need to consider purchasing the right antenna and getting it installed correctly. This article will highlight tips on TV antenna installation guide.

Fig 2.1 configure TV antenna

- **Blank screen or poor picture on your TV may result from**

- ✓ incorrect tuning or other failure in the TV set
- ✓ problems in the antenna system
- ✓ maintenance or other interruptions in the distribution network
- ✓ interference from an outside source, e.g. an electrical device or radio equipment
- ✓ Adverse effects caused by atmospheric phenomena, i.e. radio propagation conditions.

When installing your TV antenna, the process to be followed will depend on the kind of aerial you're using. Although there are many types of TV antennas, the antennas can be categorized into two – the indoor and outdoor antenna. Now, the indoor antenna is not very common since it can only be used where the reception signal is high. Therefore, many people result in using the outdoor antenna that is sometimes boosted using antenna boosters to ensure better reception. So, what should you know when installing an outdoor antenna?

If you're getting your outdoor antenna installed, there are several things you need to know. First, you need to see the direction of the signal. It is where the transmission centre is, and your TV antenna needs to cave towards that direction. You can understand this by checking the direction of antennas in your neighborhood. You can as well distinguish the path if you know where the nearest transmitter is. After determining this, the next thing is to check if there are tall buildings or other structures that might be blocking the signal. If there are such structures, then you might consider raising your aerial higher to avoid the barrier or repositioning the antenna. When everything is done, you can then install the antennae. However, ensure that you can handle the connection before doing it on your own.

The TV antenna installation guide given above might sound very easy, but it's not as simple as it seems. There is a lot of work to do when it comes to testing the signal strength. Therefore, if you do not know how or you're unable to connect your antenna, the best thing to do is to hire professional antenna installation services and have your antenna installed professionally. It is the only way you can be sure to enjoy quality picture on your new TV set. There are many TV antenna installers, and so you can be sure that you won't run short of options.

- **Preparation, Assembly And Installation Of Antenna**

Part 1: Gather information and materials

1. Locate the TV satellite direction and ensure that there is a clear, all year, unobstructed line of sight to the satellite. Check that no buildings or trees are in the signal path and it is also free from occasional blockages due to vehicles or passers-by. Locate the local TV tower direction. It is worth looking at neighboring homes with terrestrial

outdoor antennas to note which direction antennas are pointed. Information about how to locate local TV towers can be found in the Installation Overview section above or at antennaweb.org.

2. Visit dishpointer.com to find the dish pointing parameters for your home. Record the details in the table below as the information will be required during dish and antenna site survey and during alignment.

3. With the information above, identify a suitable external location to install the satellite dish and terrestrial antenna.

4. Choose the ideal location in the home for the TV receiver.

5. Measure all cable runs and purchase source cable, cable clips, connectors, dish and antenna fixings.

6. Unpack and assemble the dish and antenna

7. Install the dish and antenna system to a solid stable surface, install grounding system, run. Cables to TV receiver location and align dish and antenna

8. Connect all cables and power to TV receiver and TV and power on to test.

Part 2: Choose an installation position

.

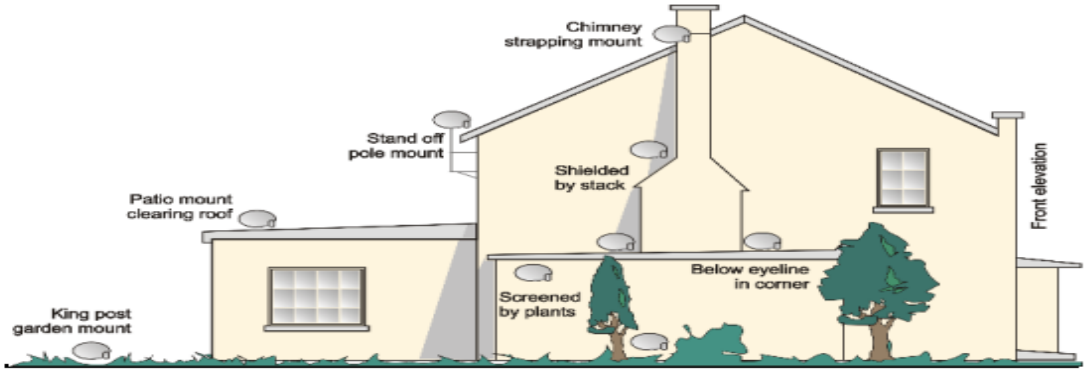


Fig 2.1 Location of antenna

The dish and antenna can be co-located on the same bracket if a position can be found on the building or at the chosen mount location allowing both signals to be received. The antenna can be mounted above the dish using the supplied J pole (mast) and bracket or below the dish to the Dish J Pole using the supplied bracket. If the dish and antenna cannot be co-located, then the terrestrial antenna cable can be run to the dish location or installed directly to the TV receiver location where a cable combiner will be required Care should be taken in choosing the distance of the dish with respect to the TV receiver and it s recommended that no more than 100 feet of cable is used between the two. The dish can be mounted to various surfaces as long as the correct fixings are utilized. This could be brick, cinder block, wood, flagstones or a pole mounted into the ground. It is possible to install on some roofs or wall sidings, but this should only be attempted by a professional installer who has had the correct training. Care should be taken to ensure that the Dish J Pole is installed in a precisely vertical position for the parameters recorded earlier in the table to be accurate. Pole mounts may require the pole being cemented into the ground. If so, the pole cement will need
time to set. 150 lbs of fast-setting concrete is recommended for a pole mount. The installation should not be in a place where it can be damaged during normal day to day living such as being bumped by children playing the satellite dish and antenna has been built to withstand most kinds of weather. However, extremely strong winds could cause damage or move the dish or antenna causing signal disruption. A strong and stable mounting surface is required to ensure that the signal is robust and uninterrupted reception of TV services is maintained during snow, rain, and heavy cloud cover Seasonal changes can affect tree cover which could interfere with the signal path. Consideration should also be given to access to the dish if it becomes necessary to clear snow or ice from its surface. Make sure the best and final location for the dish and antenna has been identified before drilling any holes in the building or setting up the mounting pole to avoid causing unnecessary damage Once the position for the dish and antenna installation has been confirmed using the direction location of the satellite and local TV towers, identified earlier, it should be possible to carry out a test installation to ensure that clear line of site is achievable and the satellite and terrestrial signals can be received at the dish /

antenna location. If a signal meter is not available, the TV receiver signal test screen will be used to assist in pointing the dish to the strongest quality r. attempted by a professional installer who has had the correct training. Care should be taken to ensure that the Dish J Pole is installed in a precisely vertical position for the parameters recorded earlier in the table to be accurate. Pole mounts may require the pole being cemented into the ground. If so, the pole cement will need

time to set. 150 lbs of fast-setting concrete is recommended for a pole mount. The installation should not be in a place where it can be damaged during normal day to day living such as being bumped by children playing the satellite dish and antenna has been built to withstand most kinds of weather. However, extremely strong winds could cause damage or move the dish or antenna causing signal disruption. A strong and stable mounting surface is required to ensure that the signal is robust and uninterrupted reception of TV services is maintained during snow, rain, and heavy cloud cover Signal.

Part 3: Choose a mounting option

the dish mount can be mounted on brick, cinder block, and wood, pole on the building side or flat surface. The dish mount can also be fitted on the roof; however, care should be exercised, and roof and siding installations should only be attempted by qualified professionals. It is important that all fixing surfaces should be flat and even. Weather sealant should be applied to any drilled holes Mortar between bricks or cinder blocks should be in very good condition. The wall mount should straddle several bricks, not be mounted to the mortar between bricks or in the top layer of bricks or those at the edge of the wall. On cinder block walls or surfaces suitable toggle anchors should be inserted into the cinder block cavity. It is not recommended that the system is fitted to aluminums or vinyl siding. When fitting to siding it may be necessary to fit shims to even the surface where it is not flush, and the fixings should be fitted to the solid background surface or to the studwork. The studwork can be identified by tracking the fixing nails or using a stud finder when fitting the reception system to a roof, care should be exercised and only attempted by a professional. The mounting brackets should be attached through the roof to the rafters. To prevent the roof from leaking, caulk or silicone sealant should be used

around all the holes and at the bottom of the mounting bracket where it contacts the roof surface when fitting on a wooden deck or beam it is important to ensure that the wood has a solid foundation and that it does not flex at all. Wooden banisters or railings are not suitable locations.

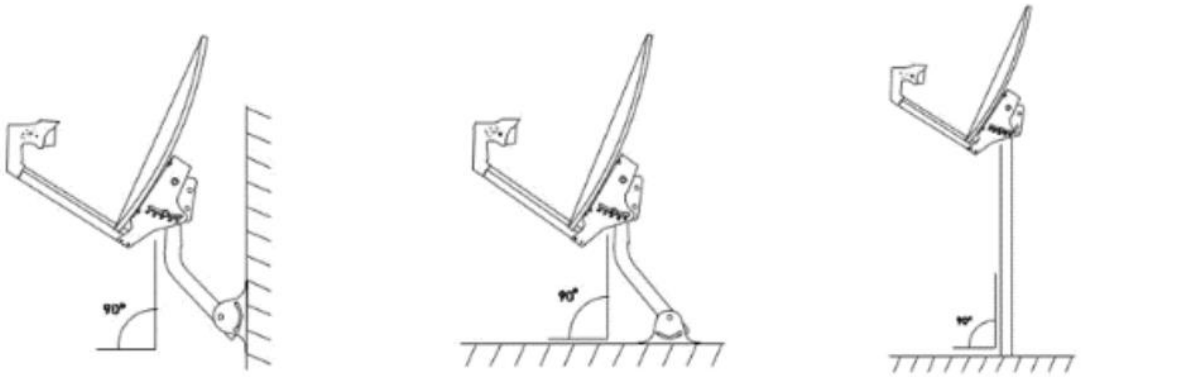


Fig.2.2 Choose a mounting option

Part 4: Assemble the dish and TV antenna.

Unpack the terrestrial antenna and fold out the 2 rear elements as shown and tighten in place using. The fitted wing nuts. These can be fully tightened as they are not required for later adjustment

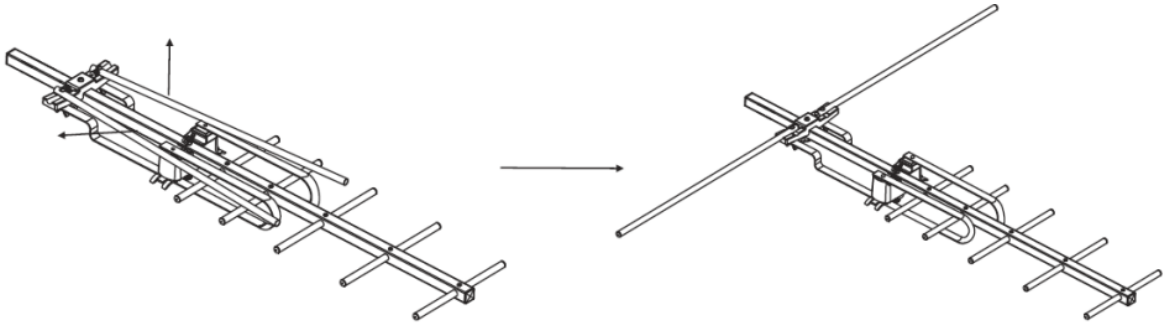
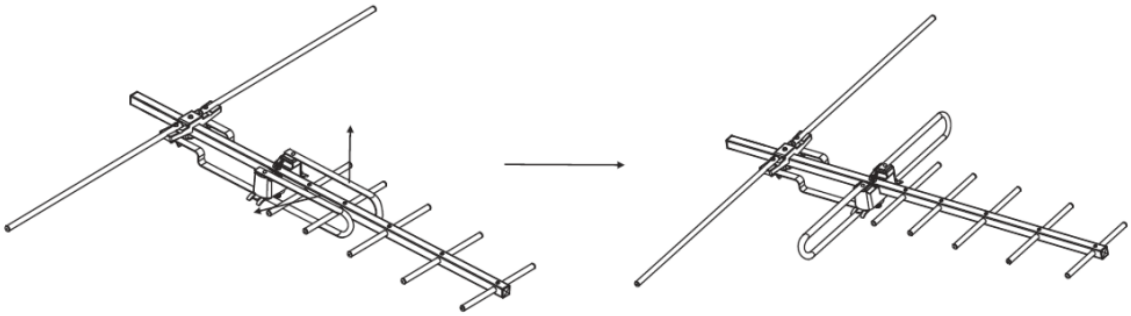
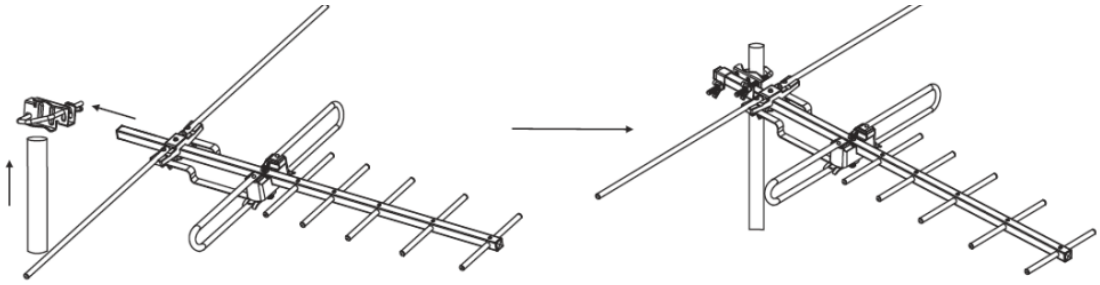


Fig 2.3 Assemble TV antenna

Fold out the 2 inner looped elements as shown and tighten in place using the fitted wing nuts. These. Can be fully tightened as they are not required for later adjustment



Using the TV Tower location setting detail recorded earlier, fit the antenna to the toothed clamp in the correct orientation and slide the clamp onto the antenna mast pole. Loosely fix the wing nuts on the U clamp bolts to prevent the antenna from sliding down the mast during the other adjustments but do not tighten as further adjustment will be necessary. If the antenna is being fitted to the Dish J Pole of the dish assembly below the dish the mast may not be required



Unpack the dish parts and fasteners. Some bolts should be fitted only finger tight until final installation takes place.

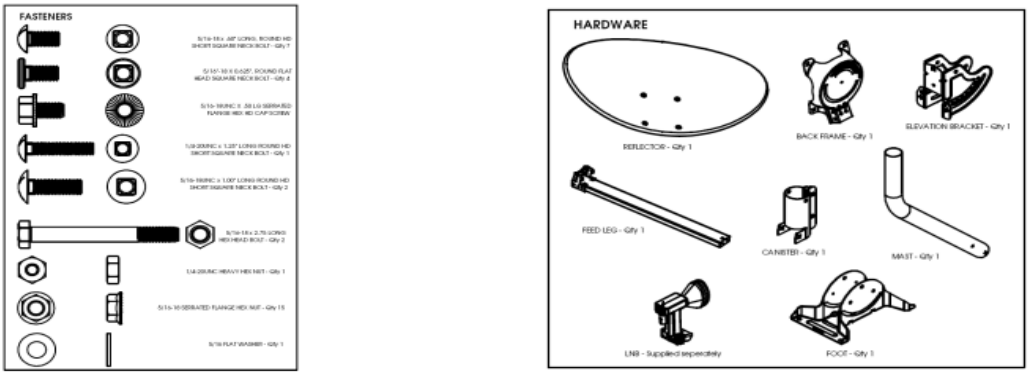


Fig 2.5 the dish

Dish Assembly Step 1

If a satellite dish from another company is already installed, it may be possible to replace it with the TV satellite dish. If a DIRECTV dish is present, you may be able to use the existing mast. If a Dish Network dish is present, install a 1 5/8” to 2” pole adaptor. If neither of these options is available, install the TV mast. If the Dish J Pole and foot/wall fitting is being used, assemble the Dish J Pole to the foot/wall mast using the short bolts into the slotted adjustment channel. Fit the long bolt through the tube and the pivot holes. Fit the nuts and finger tighten as further calibration is required for vertical adjustment during mounting

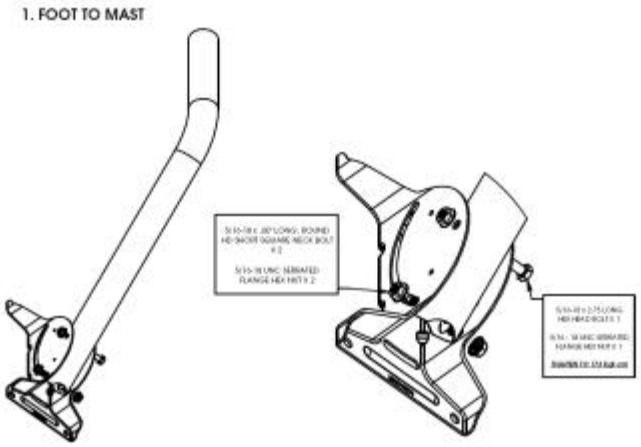


Fig 2.6 assembly dish step one

- **Dish Assembly Steps 2 and 3**

Insert the 2 short canister tightening bolts into the canister clamping edge, fit the nuts and finger tighten as further calibration is required for azimuth adjustment during alignment. Place the canister into the elevation bracket and fit the long bolt through the tube and the pivot holes of the elevation bracket. Fit the 2 small bolts into the slotted elevation adjustment channel and into the canister holes Fit the nuts and finger tighten as further calibration is required for elevation adjustment during align

Fig 2.7 assembly dish step 2 and 3

- **Dish Assembly Step 4**

  Fit the LNB feed arm to the back frame and secure using the 4 short screws. These can be fully. Tightened as they are not required for later adjustment

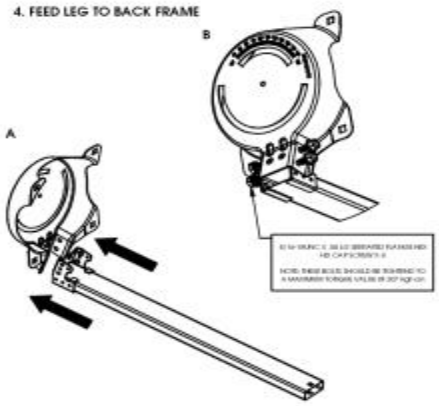


Fig 2.8 assembly dish step 4

- **Dish Assembly Step 5**

  fit the back frame to the elevation bracket using the 3 short bolts. Fit the nuts and finger tightens as further calibration is required for skew adjustment during alignment. The bolt heads should be inside the back frame to allow access to the nuts after the reflector has been fitted

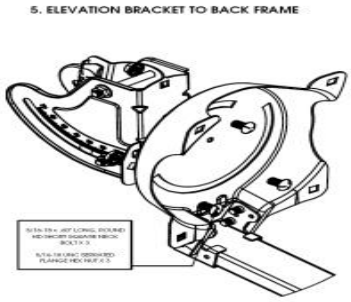


Fig 2.8 assembly dish step 4

- **Dish Assembly Step 6**

  fit the reflector to the back frame using the 4 short bolts. Fit the nuts - these can be fully tightened as. They are not required for later adjustment

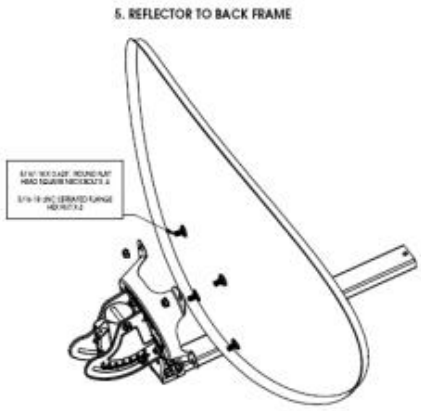


Fig 2.9 assembly dish step 4

Dish Assembly Step 7

Fit the LNB into the feed arm by pushing it fully in and fit the short bolt. Fit the nut and fully tighten as this is not required for later adjustment.

Fig 2.10 Fit the LNB

- **Dish Assembly Step 8**
  if wall or floor mounted and the Dish J Pole is being used drop the canister over the end of the Dish J Pole but do not tighten as further calibration is required for azimuth adjustment during alignment. If the dish is fitted to a pole in the ground or other alternative fitting, then the canister will drop onto that installed pole

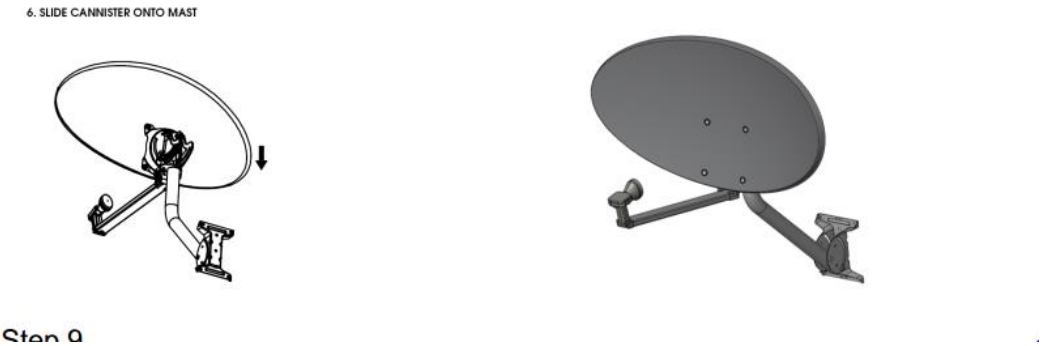


Fig 2.11 Assembly step 9

- **Dish Assembly Step 9**
  If the terrestrial antenna is being co-located with the dish, fit the antenna mast clamp to the Dish J pole so it sits either to the left or right of the main Dish J pole, as required, and finger tighten the nuts on the mast clamp. Fit the terrestrial antenna to the end of the mast and finger tighten to prevent it sliding down the mast. The terrestrial antenna will need to be fitted either in its vertical or horizontal mode depending on the information recorded earlier

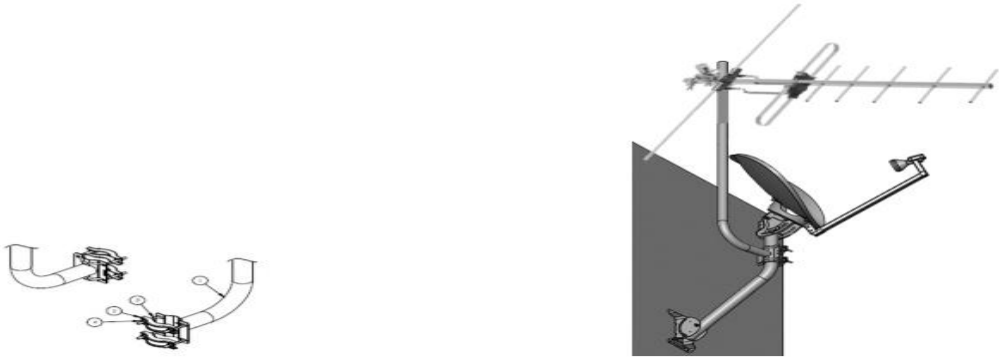


Fig 2.12 Assemble step 9

Part 5: Install the Dish Mount

• Before the dish is installed into its final location, ensure that it is possible to route the cable from the dish location into the building where the TV receiver is located, drilling holes where necessary

• Depending on the final location of the dish and antenna, mount the wall / floor / pole to the chosen solid surface using suitable screws.

• Slide the dish canister off the Dish J Pole and set the dish assembly aside taking care not to damage any of the component parts.

• Fix the wall / floor / pole mount to its final location, using a level or plumb line to adjust the Dish J Pole so that, when the wall / floor / pole mount is fixed to the surface, the vertical part of the mast behind the dish is as close to vertical as possible. Tighten the wall / floor / pole fixing bolts according to the supplier recommendations

Self-Check -2	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. _____ Installation guide given above might sound very easy, but it's not as simple as it seems. (3 points)

D. TV antenna C. Radio antenna

E. Dish antenna D. Assessments

2. Gather information and materials of antenna installing which part is Correct

A. Locate the TV satellite direction

B. Choose the ideal location in the home for the TV receiver.

C. Measure all cable runs and purchase source cable

D. All

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

You can ask you teacher for the copy of the correct answers.

Information Sheet-3	Determining the optimum location for an antenna installation

3.1 Location of antenna

- **Signal**

In electronics, a **signal** is an electric current or electromagnetic field used to convey data from one place to another. More complex signals consist of an alternating-current (AC) or electromagnetic carrier that contains one or more data streams

Signal means information and processing means operation. It means how information in the form of signal is operated or modified to get desired signal and how system process these signal any information generated in this world is a signal. it could be a image, a analog voice signal or digital signal of processor

- **Signal Distribution**.

Radio Frequency (RF) signals which can carry TV and Radio signals can be distributed around a building to serve a number of users. One method of distributing RF signals within a building are fixed cables.

- **How to get the best signal?**

We often hear the same questions: why am I not getting a good signal? What should I do to improve the quality? What are the pros and cons of installing different antennas? And so this blog will give you all the information you need to answer these questions. Whether you are looking for help with indoor digital antenna installation, loft installation or even outdoor TV antenna installation, we have it covered. We can even help you get Digital TV at no extra cost. By the time you finish reading this blog, you will be a master in the art of TV antenna installation.

To test Your Antenna Signal

The above method is a tried and true way to test your cable for defects, however, this article is intended to show you how to test your HDTV antenna signal strength. To do this you will need

to purchase an antenna signal strength meter readily available on Amazon for a reasonable price.

Once you have your meter in hand follow these simple steps to test and dial-in your antenna for optimal signal quality.

- Disconnect the antennas RG6 coaxial cable from your television or tuner. The idea here is to install your antenna signal meter in-line between your antenna and your television set or tuner. This will allow your antenna signal to pass through the measuring device so that you can find the optimal direction for your antenna for a given channel.

- Attach the antennas “F” connector, or more commonly, “RG6” connector to the socket on your antenna signal meter marked “Antenna”. Make sure this is the cable coming in from your antenna.

- Now connect your television or tuner to the socket on your antenna signal meter marked “TV”. This will complete the in-line connection from your antenna, to your KING SL1000 Sure Lock TV Signal Meter, to your television

- Turn your antenna signal meter ON, and tune-in the lowest broadcast channel for your area. This will be the starting point for our tests

- Slowly rotate your antenna 360 degrees and stop at the highest antenna signal strength. On the KING SL1000 Sure Lock TV Signal Meter this will be the green LEDs. The more LEDs that you have illuminated, the higher the incoming signal strength is.

- Use a compass to read the direction of the highest antenna signal and record the result. If you don’t have a compass (who really does these days right!) they are fairly inexpensive to pick up. I recommend this inexpensive wrist watch compass on Amazon for the task.

- Continue this pattern (steps 4 and 5) for each channel recording each result. What you want to do now is increment to the next channel and repeat steps #4 and #5. Tune in the channel and record the direction of the highest signal level for that channel.

- Use your compass readings to calculate an average for optimal signal strength if you do not have a rotor and point your antenna in that direction. If you have a rotor, create a list of optimal directions for each channel. This YouTube video below show you how the KING SL1000 Sure Lock TV Signal Meter is used not only as a signal strength meter, but also as a antenna signal troubleshooting device.

Signal Splitter

Distribution Amplifier

Fig 3.1 Signal distributor

The most important element of a TV antenna system is the antenna and a close second is the signal distribution system. The distribution system transports the TV signal from the antenna to the TV. This includes the coax cable, signal amplifiers, signal splitters, etc…
Anything that's in line between the TV antenna and the TV is considered to be part of the antenna distribution system.

It doesn't matter if you install the best antenna available and the TV antenna is doing its job receiving all of the channels if the distribution system doesn't effectively deliver the signal from the antenna to the TV.

- ✓ **Signal Amplifiers**

  No matter what coax cable is in use there will be signal loss as the TV signal travels the coax cable to the TV. A quality solid copper cable keeps this loss minimal but signal amplification may still be necessary to offset the cable resistance. The amount of signal amplification required is in direct relationship to the length of the coax cable from the antenna to the TV and if a signal splitter (divider) will be in line. At this point I suggest you visit the article titled “TV Antenna Preamplifier's and Distribution Amplifiers“. At this link you can learn when to use a preamplifier or distribution amplifier. You will **a**lso find a chart that will help determine which amplifier is best for your particular TV antenna system. In many cases if the antenna will supply a single TV without the use of a signal splitter with a coax cable length from the antenna to the TV of 50 feet or less signal amplification will usually not be needed. However, in weak signal areas using a preamplifier is almost always a benefit.

- ✓ **Multiple TV’s From One Antenna**

  Many times there is more than one TV in the household that will be connected to the TV antenna. To distribute the signal to multiple locations requires the use of a signal splitter. A signal splitter is a device with one coax cable input and multiple coax cable outputs. You will find available 2 way, 3 way, 4 way, 6 way and 8 way signal splitters. The number determines the amount of coax cable outputs the splitter will have. In the picture to the left is a 3 way signal splitter. The 3 way splitter consists of one input and three outputs. When using a signal splitter you will like need a signal amplifier. The system should be kept balanced. In other words, if you have six locations where you want TV signals to be available don’t install a 2 way splitter and run one output of that 2 way splitter to another 2 way splitter and so on. Never daisy chain signal splitters**.** It is best to install home run coax cable lines from one signal splitter to each TV. This method may be a little more work but it will pay off in performance.

- **Location**: There are three types of TV antennas you can choose from: indoor antennas, outdoor antennas and loft antennas. All have different methods of installation with pros

and cons. We recommend you choose a TV antenna depending on your location. Opt for an indoor antenna if you live close to a transmitter in a good signal area. A loft or outdoor TV antenna works better in weaker signal areas.

- **To test your antenna signal, follow these steps**:

✓ Disconnect the antennas RG6 coaxial cable from your television or tuner.
✓ Attach the antennas “F” connector to the socket on your antenna signal meter marked “Antenna
✓ Connect your television to the socket on your antenna signal meter marked “TV”.
✓ Turn your antenna signal meter ON, and tune-in the lowest broadcast channel for your area.
✓ Slowly rotate your antenna 360 degrees and stop at the highest antenna signal strength (usually indicated by LEDs).
✓ Use a compass to read the direction of the highest antenna signal and record the result.
✓ Continue this pattern (steps 4 and 5) for each channel recording each result.

Use your compass readings to calculate an average for optimal signal strength if you do not have a rotor and point your antenna in that direction. If you have a rotor, create a list of optimal directions for each channel

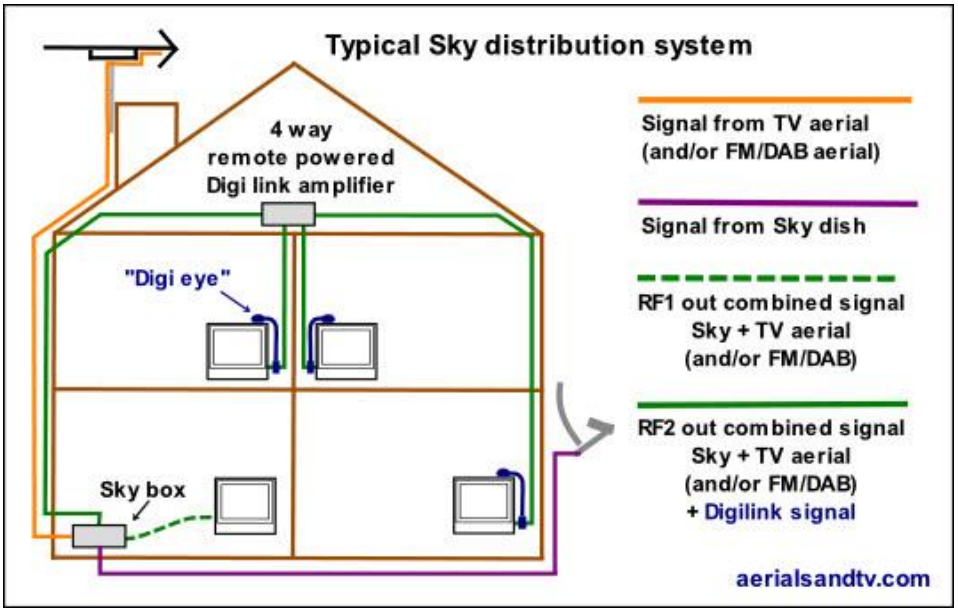


Fig 3.2 Signal distribution system

3.2 Types of Antennas

3.2.1. Installing an indoor TV antenna

This is the easiest type of TV antenna installation as you only have to plug in the coax cable from the TV to the antenna and stand it next to the TV. If the picture still appears fuzzy you can try moving the antenna next to a window. It is best to keep a direct line to the transmitter, so don't let the antenna get obstructed by (metal) objects. If the picture is still not perfect, then try to place it as high as possible to get a better signal and move the position from left to right until you have a clear picture. Always remember to rerun the channel scan every time you reposition your TV antenna.

Fig 3.3 Indoor antenna

3.2.2 Installing an outdoor TV antenna

Outdoor TV antenna installation is the most work. Ensure you work carefully adhering to safety rules when installing an antenna on the roof or side of your house. Follow the instructions to the letter. To help find the right position for the TV antenna, take a peep at what your neighbors have done – all antennas should be facing towards the transmitter. Always check the picture is clear before attaching it. If in doubt, always get a professional to carry out the task for you – worth every penny to avoid the hassle!

Fig 3.4 Out door antenna

- **Finalize your Antenna installation in 3 easy steps**

After you have the TV antenna in the right position you have to complete a channel scan to finalize the installation. In just 3 simple steps, you can be watching your favorites TV program me with a clear picture. Here's how:

- Press ‘MENU’ on your remote control (this could be your TV remote control or your STB (setup box) remote control - it’s the one that changes the channels).
- Select ‘SET UP’ on the menu. If you can’t find this option, please check your owner’s manual for specific instructions on how to rescan.
- Choose ‘ANTENNA’, then ‘CHANNEL SCAN’ or ‘AUTO TUNE’. Your TV will automatically rescan the available signals which may take a few minutes. Once completed, all your channels will be tuned-in. don’t forget to rerun the channel scan again if you move your TV aerial.

Self-Check -3	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

7. _____ this is the easiest type of TV antenna installation as you only have to plug in the coax cable from the TV to the antenna and stand it next to the TV. (**3 points**)

H. Outdoor antenna B. Indoor antenna

I. Signal distribution D. none

8. _____ is an electric current or electromagnetic field used to convey data from one place to another

A. signal C. signal distributers

B. signal splitter D .All

Note: **Satisfactory rating –3 and 4 points** **Unsatisfactory - below 3 and 4 points**

Information Sheet-4	Installing straight and square Accessories in the required locations

4.1. Choose their quire Location of the Antenna

- Place Your TV Antenna

Finding a good location for your TV antenna can mean the difference between getting only a few channels and receiving all the stations in your area.

Installing an antenna outdoors will always be better (in terms of reception) than putting it inside whether in your attic or your living room.

This is because the structure of your house, such as walls, attic insulation, or a metal roof, introduces interference and weakens signals

Fig 4.1 places of antenna

An outdoor antenna will therefore experience less interference, although you might still have local obstacles such as forests and hills to contend with.

When positioning your outdoor antenna, always try to get a clean and direct line of sight to transmission towers if possible, in order to further minimize possible sources of interference

- **How High Should You Install an Outdoor Antenna**?

Ideally, you should install the antenna around 30 feet off the ground.
Regardless of how high you can install it though, just mount it as high as you can so that it clears the majority of local obstacles in its line of sight. Remember that if a surrounding house or structure casts a shadow on the antenna, it will likely block or weaken TV signals coming from that direction If you're installing the antenna on a metal roof, I'd advise mounting it on a mast of at least one meter (around 3.3 feet) above the roof to minimize interference

- **Look at the Neighbors' Antennas**

Lastly, take a look at where your neighbors' antennas are pointing. This also gives a good indication of where transmitters are.

- **Prepare the Tools**

Get all your tools and parts together before starting the installation. Make sure your tools are in working order and that all the antenna's parts have been delivered, by cross-referencing these with the antenna installation manual.

4.2. Installing straight and square accessories

The largest part of the satellite is the round, bowl-shaped dish. The parabolic shape of the dish is designed to capture radio waves sent from a satellite and reflect them out onto a single point. The single point is the device that juts out in the center of the dish and is known as a feed horn.

- ✓ **Parts of satellite dish**

  Satellite dishes come in many different sizes, but you may have noticed that most TV satellites that are used in homes look quite similar. They also contain the same basic parts that allow them to receive and process radio waves beamed from satellites, passing them inside to your TV.

- ✓ **Function**

  In satellite TV reception, the dish sits on or outside your home or business. Essentially, the dish is the middleman in satellite television, receiving the broadcast signal from the orbiting satellite and passing it along to your receiver where it can then be converted into the television programming you watch.

- ✓ **Features**

  The largest part of the satellite is the round, bowl-shaped dish. The parabolic shape of the dish is designed to capture radio waves sent from a satellite and reflect them out onto a single point. The single point is the device that juts out in the center of the dish and is known as a feed horn. A support arm holds the feed horn the appropriate distance in front of the dish to properly receive the waves.

✓ **Effects**

Once the feed horn has received the signal, it sends it to the Low Noise Block Converter (LNB), which amplifies the signal and converts it to a lower frequency, sending it via cable to the satellite receiver inside. In more modern satellite dishes, the Low Noise Block Converter and feed horn are a single unit referred to as an LNBF. The satellite receiver, in turn, decodes the signal, splits it into individual channels and passes the video information to your television.

- **TV antenna accessories**

	**TV Antenna COAX CABLE** HIGH QUALITY RG-6 SOLID COPPER CENTER WITH ALUMINUM BRAID EXCELLENT FLEXIBILITY Available cut to order with cable connectors attached in the on line store or by calling TV Antenna Source Related Link TV Antenna transmission line
	**Coax Cable END CONNECTOR** NICKEL PLATED BRASS "Won't Crack" HIGH QUALITY FITTING MAKE A PERMANENT CONNECTION WHEN CRIMPED PROPERLY
	**TV Antenna SIGNAL SPLITTER** DIVIDES COAX CABLE WITH MINIMAL SIGNAL LOSS ZINC PLATED

	**NAIL CLIP WIRE FASTENER** FASTENS WIRE SECURELY

Information Sheet-5	Terminating Cables and conductors

5.1. Terminating Cables and conductors

There are a variety of methods used to terminate electrical equipment such as, Welding Wires, Soldering, Insulation Displacement Connections, Crimping, Ultrasonic Welding, etc. You spread Cheddar cheese on it and leave the mice to gnaw through the equipment.

- **cable** is a thick wire, or a group of wires inside a rubber or plastic covering, which is used to carry electricity or electronic signals. Cable used to refer to television systems in which the signals are sent along underground wires rather than by radio waves

Cable Coupler: A means enabling the connection, at will, of two flexible cables. It consists of a connector and a plug.

- **Conductor** is a substance in which electrical charge carriers, usually electrons, move easily from atom to atom with the application of voltage. Conductivity, in general, is the capacity to transmit something, such as electricity or heat. Copper, steel, gold, aluminum, and brass are also good conductors.

Types of conductor

- ✓ Conductors conduct electrical current very easily because of their free electrons.
- ✓ Insulators oppose electrical current and make poor conductors.
- ✓ Some common conductors are copper, aluminum, gold, and silver.
- ✓ Some common insulators are glass, air, plastic, rubber, and wood.

- **Coax Cable**

A transmission line that consists of a tube of electrically conducting material surrounding a central conductor held in place by insulators and that is used to transmit telegraph, telephone, television, and Internet signals called also **coax cable**.

Always uses high grade solid copper wire coax cable. Many of the coax cables offered on the market have a copper clad center wire. Copper clad is a steel wire coated with copper and it's not as efficient as a solid copper wire. You can determine if wire is solid copper or copper clad by placing a magnet onto the end of the wire. If the wire is attracted to the magnet it's copper clad. If the wire isn't attracted to the magnet it's solid copper.

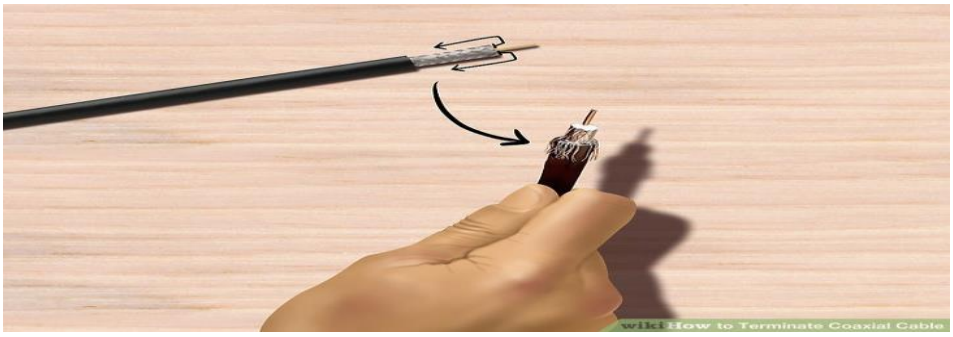


Fig 3.2 Coaxial cable

There are three basics sizes of coax cable in use for TV reception. The smallest and least efficient is RG 59 a better choice is RG 6 and the ultimate is RG 11. Frankly, RG 11 is very hard to work with, it's stiff, expensive and the benefits are minimal over RG 6 cable. All in all RG 6 solid copper coax cable is likely the best choice for most applications

Coaxial cable construction includes 4 parts:

- Inner conductor.
- Outer conductor, typically a shield (an optional second shield can be present as well)
- Dielectric material to separate the inner and outer conductors.
- Jacket.

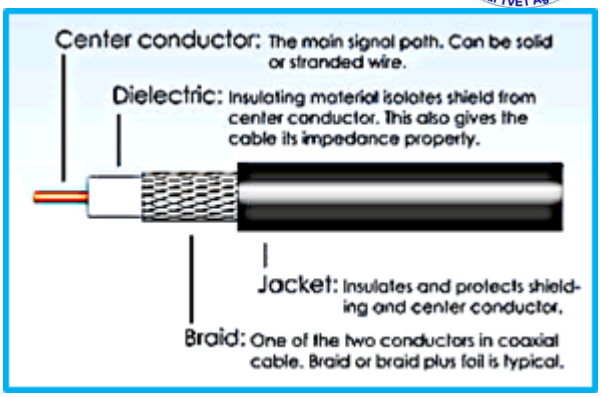


Fig 3.3 coaxial cable parts

Self-Check -3	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1._____ which one of coaxial cable parts. (**3 points**)

A. Center of conductor B. Braid

C. Dielectric D. All

2. One of the followings is types of conductor

A. copper, aluminum, gold, and silver C. Steel, rubber, and copper

B .glass, air, plastic and rubber. D.A & B

Note: **Satisfactory rating –3 and 4 points** **Unsatisfactory - below 3 and 4 points**

You can ask you teacher for the copy of the correct answers.

Information Sheet-6	Referring for procedure on-routine events

6.1 Refer procedures of antenna on routine events

- Do I have the right antenna system?

All Developed country should generally be able to receive free-to-air television, either terrestrially or via satellite (if terrestrial coverage is not available), provided they have the correct receiving equipment. TV broadcasters provide this service, with support from the Australian Government.

The most common cause of poor TV reception is that thing on the roof of your antenna. An antenna that's poorly maintained, broken or incorrectly installed is likely to be behind your reception problems

Fig 3.5 right antenna system

following the recent switchover to digital TV and the consequent retune (check out for more information), now's a good time to check if your antenna system is in the right shape and form, especially if it's been exposed to harsh weather over a long period. Digital TV means a host of

new channels should be available in your area, so make sure your antenna isn't coming between you and good reception!

If you have the right equipment what's technically called an 'optimized television receiving installation 'you'll be much less susceptible to reception problems.

A number of elements are important when assessing your antenna system, including:

- Where you live this determines signal coverage and frequencies.
- What equipment you have the simpler, the better! You need a good single antenna, a good cable and a fly lead.
- How it's installed your antenna should be outdoors, pointing towards the right TV tower and correctly 'polarized'.
  How it's maintained make sure your antenna isn't rusty or broken, and has no missing elements

Assessing your current antenna installation system or considering buying a new one? Go local! An expert from your area will know the region's specific antenna requirements and consider the following factors:

- What channels are required?
- What signal coverage (strength) is available?
- What, if any, reception problems exist in the area?
- Will a masthead or distribution amplifier (signal booster) be necessary?

The right fit

Your antenna is only doing its job properly if it can receive television signals in your area. The design, size and type of antenna and how it is installed can affect its performance. The size and shape of an antenna depend on two main characteristics:

- Which specific frequencies the antenna is designed to receive.

- The gain of the antenna in areas of poor reception, it may be necessary to increase the received power of the broadcast signal with a more directional, higher gain and frequency band-specific antenna.

The right frequencies

Digital terrestrial television signals in Australia are broadcast in VHF Band III (VHF channels 6–12) and UHF Band IV and V (UHF channels 28–51).

Your antenna needs to be designed to receive the particular television frequencies in your area. Remember that television frequencies are location-specific, so check out the my Switch website for tailored information before buying an antenna.

The right features

Getting a little technical now, a good antenna will meet the following key criteria:

- Provides enough signal gain for your specific frequencies so your TV receiver will get a strong enough signal level without requiring additional signal amplification (a signal booster).
- Shows good directivity and front-to-back ratio so it minimizes reception of unwanted signals.
- Is robust enough to withstand harsh weather conditions or the continual attention of large Australian birds.

A number of antennas either manufactured and/or designed in Australia meet these criteria, but antennas designed for other markets or for global distribution may not, so do your research or ask the experts.

The wrong features

Some antennas will rarely give you good TV reception and are best avoided:

- Indoor antennas (sometimes called 'rabbit ears') in areas of high signal strength, an indoor antenna may just be sufficient to receive some or all TV channels. However, it may make your signal more susceptible to interference.
- Antennas designed to receive either FM radio or TV channels in the VHF band 1 and 2

- Multiple antennas, combined and used to receive signals from a few broadcasting sites, will make your receive system prone to interference and reception difficulties. Talk to your antenna installer about removing any legacy antenna that is no longer needed.
  Cabling, connectors and fly leads

  For good TV reception, you should use so-called ‘quad-shield coaxial cable’ (type RG6) with ‘F’ type connectors. Quad-shield cable provides better shielding against noise and external interference than single- or dual-shield cables.

  Fly leads, which are used to connect wall outlet plates to either the set-top box or TV, are generally the weakest link in the antenna installation. Quad-shield fly leads provide superior performance compared to other types. You should take care to maintain adequate clearance (at least 50 mm) from AC mains power cabling and leads to minimize induction of impulse noise. Excessive bending and long fly leads can also cause problems for TV reception. It’s best to use custom-made fly leads rather than connecting two or more leads.

  Sometimes you need to use ‘splitters’ to divide the signal from the antenna so that two or more TV receivers can operate effectively from one antenna system. But be careful—using a splitter can mean some loss of signal.

Be careful with signal boosters

Masthead amplifiers (MHA) or distribution amplifiers often called ‘signal boosters’ are not an integral part of what we call ‘optimized television receiving installation’. They should be installed only if necessary. These kinds of devices can cause reception difficulties and even interfere with your neighbors’ TV reception, so do your research before using them.
An MHA or ‘booster’ should only be used in areas where television signals are very weak because of intervening terrain, vegetation and buildings, or due to the distance between the broadcast transmitter and television antenna. A distribution amplifier is used to distribute the signal to several television receivers. Unlike an MHA, a distribution amplifier is installed within the building in which it operates, normally within the roof area. Distribution amplifiers can be

used in houses with multiple TV sets, hotels, motels, blocks of units and similar high-occupancy buildings.

If your local expert determines that a masthead or distribution amplifier is necessary to provide enough signal level to your television receivers, we strongly advise that you ask her or him to install an amplifier with a built-in filter or to install a filter in front of the amplifier. This will limit the potential impact of mobile broadband signals on your television reception.

- ✓ **Safe and sound**

Climbing on the roof is extremely dangerous, so contact the experts to make sure your antenna is safely and correctly installed.

Your antenna should be installed outdoors, up to five meters high for urban and suburban areas and up to 10 meters high for some rural areas or areas with marginal coverage, pointing towards the TV tower that provides the best television coverage for your area.

Check out the my Switch website to find the direction of the best transmission tower for your location.
The signal level may vary significantly for different locations on your roof. Your antenna installer should be able to do a site survey and find the best location for your antenna on your roof, free of local clutter (big trees and surrounding building) and other local signal obstacles.

If you're replacing your antenna, don't assume the best spot is an existing location/pole. The environment may have changed due to mature trees and new buildings. A fresh site survey for good signal strength and quality signal may be necessary but remembers that this is a job for the experts!

Polarization

Television signals are transmitted either horizontally (H) or vertically (V). This is called 'signal polarization'. Your antenna should be installed so that its elements match the signal polarization that is, antenna elements should be installed horizontally to receive horizontally polarized TV signals and vice versa.

Signal polarization is also location-specific, so check out the my Switch website for information on signal polarization before installing your antenna.

Self-Check -3	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

9. _____ the size and shape of an antenna depend on two main characteristics. (**3 points**)

A. Which specific frequencies the antenna is designed to receive

B. The gain of the antenna in areas of poor reception

C. The right frequency

D. A & B

10. Television signals are transmitted either horizontally or vertically .(**4 points**)

A. False

B. True

Note: **Satisfactory rating –3 and 4 points** **Unsatisfactory - below 3 and 4 points**

You can ask you teacher for the copy of the correct answers

Information Sheet- 7	Carrying out the installation efficiency without waste material

7.1 Antenna installation Materials

Copper is a best suited material for base antennas. The metal, while soft and malleable, is quite rigid. Stainless steel has a higher tensile strength, so thinner wire can be used. This makes steel an excellent choice for mobile whip antennas where flexibility is a must

- **Waste**

Waste (or wastes) is unwanted or unusable materials. Waste is any substance which is discarded after primary use, or is worthless, defective and of no use. A by-product by contrast is a joint product of relatively minor economic value. A waste product may become a by-product, joint product or resource through an invention that raises a waste product's value above zero.

Examples include municipal solid waste (household trash/refuse), hazardous waste, wastewater (such as sewage, which contains bodily wastes (feces and urine) and surface runoff), radioactive waste, and others.

- Waste (or wastes) is unwanted or unusable materials.
- Examples include municipal solid waste (household trash/refuse), hazardous waste, wastewater (such as sewage, which contains bodily wastes (feces and urine) and surface runoff), radioactive waste, and others

What is Waste Recycling?

Recycling is processing used materials (waste) into new, useful products. This is done to reduce the use of raw materials that would have been used. Recycling also uses less energy and and great way of controlling air, water and land pollution.

Effective recycling starts with household (or the place where the waste was created). In many serious countries, the authorities help households with bin bags with labels on them. Households then sort out the waste themselves and place them in the right bags for collection. This makes the work less difficult.

Self-Check -7	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. _____ is a best suited material for base antennas. (3 points)

F. Aluminum C. Gold

G. Copper D. All

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

You can ask you teacher for the copy of the correct answers.

Operation Sheet-1	Prepare to install and set-up reception antennae and signal distribution systems

Testing Your Antenna Signal

Step 1

Disconnect the antennas RG6 coaxial cable from your television or tuner.

Step 2

Attach the antennas “F” connector, or more commonly, “RG6” connector to the socket on your antenna signal meter marked “Antenna

Step3

Now connect your television or tuner to the socket on your antenna signal meter marked “TV”.

Step 4

Turn your antenna signal meter ON, and tune-in the lowest broadcast channel for your area.

Step 5

Slowly rotate your antenna 360 degrees and stop at the highest antenna signal strength.

Step 6

Use a compass to read the direction of the highest antenna signal and record the result.

Step 7

Continue this pattern (steps 4 and 5) for each channel recording each result. What you want to do now is increment to the next channel and repeat steps #4 and #5.

Step 8

Use your compass readings to calculate an average for optimal signal strength if you do not have a rotor and point your antenna in that direction.

Operation Sheet-1	Prepare to install and set-up reception antennae and signal distribution systems

To finalize Your Antenna installation

Step1

Press ‘MENU’ on your remote control

Step 2

Select ‘SET UP’ on the menu.

Step 3

Choose ‘ANTENNA’, then ‘CHANNEL SCAN’ or ‘AUTO TUNE’.

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 3 hour.

Task 1- Install TV antenna

List of Reference Materials

1. **http://www.monash.edu.au/ohs**
2. http://retune.digitalready.gov.au

BUILDING ELECTRICAL INSTALLATIONLEVEL II

Learning Guide-40

Unit of Competence: Assemble and install reception antennae and signal Distribution Equipment

Module Title: Assembling and install reception antennae and signal Distribution Equipment

LG Code: EIS BEI2 M11 LO40-LG-40

TTLM Code: EIS BEI2 M11 TTLM 0919v1

LO3: Set-up reception antennae and signal distribution systems and report

Instruction Sheet-1	Learning Guide #1

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- Following OHS work completion risk control.
- Adjusting to the antenna and the system to optimize reception at each outlet.
- Cleaning work site
- Notifying completion of work

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, **upon completion of this Learning Guide, you will be able to**:

- Follow OHS work completion risk control.
- Adjust to the antenna and the system to optimize reception at each outlet.
- Clean work site
- Notify completion of work

Learning Instructions:

17. Read the specific objectives of this Learning Guide.
18. Follow the instructions described below
19. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
20. Accomplish the “Self-checks". Each information sheets.
21. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
22. If you earned a satisfactory evaluation proceed to “Operation sheets and LAP Tests if any”. However, if your rating is unsatisfactory, ask your teacher for further instructions or go back to Learning Activity.
23. After you accomplish Operation sheets and LAP Tests, ensure you have a formative assessment and get a satisfactory result;
24. Then proceed to the next information sheet.

Information Sheet-1	Following OHS work completion risk control

1.2 Introduction to OH&S

Occupational health and safety standards are in place to mandate the removal, reduction, or replacement of job site hazards. OHS programs should also include material that helps minimize the effects of the hazards.

Safety Precautions for Operation and Maintenance State, where applicable, hazard warnings and safety precautions of which the operation and maintenance staff need to be aware

• mandatory requirements relating to safety;

• known hazards against which protection measures shall be taken; and

• known features or operational characteristics of the installed equipment or systems which may cause hazard and the related safety precautions.

Risk control for completion of work

A general list of definitions is provided in the Definitions tool. Definitions specific to this procedure are provided below.

Acceptable level of risk: This is the level of risk that all people involved in the risk assessment process consider to be acceptable for people to be exposed to; and the level that a reasonable person would consider acceptable.

Agency: One of two parts of a hazard (other being mechanism). The agency is the “what”, i.e. the type of object that can cause injury.

Consequence: The negative outcome produced when people interact with a hazard.

Controls: Steps taken to reduce the likelihood or consequence of a negative outcome occurring for a hazard.

Hazard: A situation or something that has the potential to cause harm. Hazards have both an agency and a mechanism.

Likelihood: The chance of a negative outcome produced when people interact with a hazard.

Mechanism: One of two parts of a hazard (other being agency). The mechanism is the "how", i.e. the type of interactions with a person that can cause an injury.

Process: An activity or task. A risk assessment is generally completed to assess and control hazards associated with a process.

Risk: The combination of the likelihood and consequences of a negative outcome resulting from a hazard.

Risk assessment: A documented process for determining suitable controls to reduce the risk of hazards, and to assess the level of risk of a hazard.

Risk controls: These reduce the likelihood of a negative outcome, or mitigate the severity of the consequence.

Risk management: The process of hazard identification, risk assessment, and risk control with the aim of providing healthy and safe environment for people

- **Safety Tips**

  1) If you are not sure…..ask.

  2) Follow instructions and don't take chances.

  3) Wear your personal safety equipment.

  4) Never operate equipment you have not been trained for.

  5) Keep your work area clean.

  6) Stay clear of forklifts while they are being operated.

  7) Avoid injury by lifting correctly. If it's heavy ask for help. Max weight to be lifted is 75lbs.

  8) Make sure the job can be done safely.

  9) **DO NOT** unload a truck alone.

Self-Check -1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

4. _____ These reduce the likelihood of a negative outcome, or mitigate the severity of the consequence

A. Risk management B. Risk controls

C. Consequence D. All

5. _____ a situation or something that has the potential to cause harm. Hazards have both an agency and a mechanism.

A. Risk management C. Risk controls

B. Hazard D. All

Note: **Satisfactory rating - 3 and 5 points Unsatisfactory - below 3 and 5 points**

You can ask you teacher for the copy of the correct answers.

Information Sheet- 2	Adjusting to the antenna and the system to optimize reception at each outlet.

2.1 Tricks for Getting the Best Possible Reception with Your Indoor Antenna

For cord cutters, everything old is new again at least when it comes to using an antenna to pick up free, over-the-air (OTA) TV. As a growing number of people become tired of the rising costs of cable TV and all of the other hassles that come with it, many are cutting the cable in favor of streaming TV and OTA TV. Unsurprisingly, antenna sales have increased in recent years, with retailers like Antennas Direct reporting huge spikes in sales numbers.

All Developed country should generally be able to receive free-to-air television, either terrestrially or via satellite (if terrestrial coverage is not available), provided they have the correct receiving equipment. TV broadcasters provide this service, with support from the Australian Government.

- The vast majority of all television reception issues are caused by:

✓ cables and fly leads that are old, damaged or not plugged in properly
✓ A TV or set-top box that isn't tuned to the correct channels
✓ an antenna that isn't up to scratch or isn't pointing to the correct transmitter
✓ areas with deficient coverage or fringe reception
✓ Trying to receive signals from outside the intended coverage area of a transmitter.

Less often, your television reception may be affected by interference or signal overload from other sources. But it's important to remember if you don't have an appropriate television receiving system, you need to fix your antenna *before* looking for interference.

The causes and solutions for each of these issues can be very different, so it's important to identify exactly why you're having problems.

We've outlined a step-by-step procedure to help identify and resolve your television reception issues. In many cases, you'll need to visit the government's my Switch website, so bookmark this page!

1. Check to make sure your cables and fly leads are in good condition and properly connected between your wall socket and television set, personal video recorder (PVR) or set-top box. Loose connections, old or damaged cables and connectors may affect the quality of your television reception. Go to *Do I have the right antenna system?* for more information.
2. Go to my Switch, type in your address and look for the following information:

✓ the level of television signal coverage available in your area

✓ the TV transmitter that provides the best coverage to your address, including in which direction you should point your antenna

✓ the TV frequencies (channels) and signal polarization (V = vertical or H = horizontal) for the TV transmitter that will provide your best coverage

✓ alerts about planned outages or known reception issues in your area

✓ the retune date for the TV transmitter that will provide your best coverage (check out http://retune.digitalready.gov.au for more information).

If my Switch indicates that you live in an area with poor coverage or outside terrestrial (land-based) television coverage, you'll need to receive digital TV via satellite through the Viewer Access Satellite Television (VAST) service. Go to Should I consider the VAST service? for more information.

3. Make sure that your receiver has been tuned to the correct channels.

This is essential to ensuring adequate reception, especially if:

✓ Your reception problems coincide with the retune date of your transmission site—if this is the case, you need to retune your TV receiver (you may want to follow the instructions in the manufacturer's manual). On your remote, press the MENU button, then look for 'set-up' options and choose 'auto-tuning' or 'channels' for manual tuning. If auto-tuning does not improve your reception, you should use manual tuning and select the channels of the TV transmitter providing the best coverage in your area.

- ✓ You live in an area covered by more than one TV transmitter—if my Switch indicates that you're in an area covered by multiple TV transmitters, your TV receiver may be tuned to weaker, more distant signals, while the good local signals are available to you. Manually tune your TV by selecting the channels of the TV transmitter that provides the best coverage in your area.

4. Make sure your antenna system is up to scratch.
   Most reception issues are caused by an inadequate antenna set-up, old or broken antennas and cabling, or inappropriate use of masthead amplifiers.

   You should have a single antenna installed on your roof. Based on the my Switch information (step two), check if:

- ✓ your antenna is the right type for the channels of the transmitter providing your best coverage
- ✓ your antenna is pointing towards the transmitter providing the best coverage
- ✓ Your antenna is correctly oriented so that its elements are horizontal or vertical to match V or H polarization of the signal.

   You should also check if your antenna is installed outdoors, is in good condition and is securely mounted, and if your cable needs replacing. A good quality cable can significantly improve your reception. For households with multiple television outlets, make sure the cabling to each wall outlet is done properly.

   Legacy or broken antennas should be removed from the roof. If you use multiple antennas pointing to different TV transmitters, you're likely to experience reception difficulties.

   Any work on your antenna system should be done by an experienced antenna installer. Your installer should also be able to advise how to optimize your antenna system to ensure reliable reception. Go to *Do I have the right antenna system?* for more information.

5. If you have a masthead or distribution amplifier (signal booster) installed, check that you actually need it.
   By default, you don't need a signal booster for adequate reception within television signal coverage areas. You should consider using a masthead amplifier only if the signal reaching your antenna is weak because of the distance from the transmitter or because it's obstructed.

Even then, using a high-gain antenna may be a better option. Talk with your antenna installer and do your research before using signal booster as these kinds of devices can actually cause reception difficulties and even interfere with your neighbors' TV reception. Go to *Do I need a signal booster?* for more information.

If your local expert determines that a masthead or distribution amplifier is necessary to provide enough signal level to your television receivers, we strongly advise that you ask her or him to install an amplifier with a built-in filter or to install a filter in front of the amplifier. This will limit the potential impact of mobile broadband signals on your television reception.

6. Make sure your antenna system is optimized (see step four).

   If your system isn't set up properly, your reception problems may be triggered or exacerbated by the rollout of new 4G mobile broadband services in your area. If you live within one kilometer of a mobile broadband base station and your antenna system has a masthead or distribution amplifier, you may experience a sudden change to your TV reception quality affecting all channels.

   Your reception problems can be resolved by optimizing your antenna system, removing the amplifier if not required or simply inserting a filter at the appropriate point in your installation. If you have experienced a sudden change to your TV reception quality, you should consult an experienced antenna installer. Go to *what's the link between mobile broadband and TV reception?* for more information.

7. If my Switch indicates that you live in an area with good signal coverage and you believe you have an optimized antenna system, but you're still experiencing reception issues, you should:

- check my Switch for planned outages or known reception issues in your area and follow alerts/advice
- talk with your neighbors and check if they're experiencing the same issue
- call an antenna installer, who should be able to identify if your reception is affected by interference. Go to *Is interference causing my reception problems?* for more information.

The pages below explain in more detail some of the main things to look out for and what you can do about them. There are some basic checks you can easily do yourself but, where

possible, we always recommend enlisting the help of reputable local experts to save you time and hassle.

- **Adjusting to the antenna and the system**

✓ The first thing you need to do before even attempting to set up your antenna is to identify the locations of the broadcast towers in your area. Ideally, you'll do this before you even buy your antenna because this will help you better understand how powerful the antenna will need to be to pick up the stations you want to watch.

There are a couple of excellent websites for locating TV signals in your area TVFool.com and AntennaWeb.org. Either of these online tools will allow you to input your street address and see a map outlining the distance and direction of the various broadcast towers in your area.

✓ **Place the Antenna In or Near A Window**

The fewer obstructions between your antenna and the broadcast towers, the better. And make no mistake–thick walls and ceilings are certainly obstructions. That's why placing your antenna in or near a window often yields the best results. Many times, this can give you the clearest line of sight to the broadcast tower, provided there isn't a major obstruction right outside of the window, such as a big tree or your neighbor's brick wall.

A couple of important notes about placing your antenna in a window. First, beware of heat absorption from the sun. With, the manufacturer recommends making sure "the white side faces outside so the antenna absorbs less heat from the sun." Also, if you're using a flat antenna, make sure you securely tape all four corners to the window so that it doesn't bend or warp over time as this will hamper reception.

- ✓ **Go High**

One of the things you'll notice when you use the signal finder tools on TV Fool, Antenna Web, or other similar sites is that you'll be asked to input the estimated height of your antenna. There's a very important reason for this. Typically, the higher your antenna is placed, the better your reception will be. That's why outdoor antennas tend to pick up so many channels.

- ✓ **Keep the Antenna Away From Any Metal**

Metallic surfaces near your antenna can cause interference with the digital signals and block your reception. For example, if you place your antenna in a window but there are metal burglar bars or a metal bug screen just outside the window, this could cause issues. Likewise, if you have a metal roof in your home, installing your antenna in the middle of the attic probably won't yield positive results.

"Try to keep as much distance as practical from these [metal] objects (6 feet or greater is ideal)," Antennas Direct recommends.

- ✓ **Test Different Antenna Placements**

While it would be nice to plug in your antenna and immediately start picking up every channel in your area in beautiful HD, the fact is you'll probably have to test a few different locations for your antenna until you can find the position that offers the best results. Using the tips in this article, try out a few locations in your home. Each time you place the antenna in a new spot, run a channel scan on your TV and see which channels are picking up. If you're using a flat antenna, I recommend using clear adhesive tape to temporarily place the antenna when running your scans.

Self-Check -2	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. _____ The vast majority of all television reception issues are caused by (3 points)

A. cables and fly leads that are old

B. areas with deficient coverage

C. A TV or set-top box that isn't tuned to the correct channels

D. All

2. To adjust the antenna and the system we follow the following steps

A. Keep the Antenna Away From Any Metal

B. Place the antenna in or near a window

C. Go High

D. all

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

You can ask you teacher for the copy of the correct answers.

Information Sheet-3	Cleaning and making work site

3.2. Cleaning work sites

Good housekeeping benefits everyone in your manufacturing establishment by creating safe and clean surroundings. Keeping floors clean and clear reduces the chance that employees will trip or fall. Uncluttered work areas leave more room to work with and less irritation from trying to find misplaced items.

Start by Cleaning up:

Begin with a thorough housecleaning. Remove all trash, accumulations of scrap, and unused materials.

Make Housekeeping an Ongoing effort:

Employees should understand that housekeeping is a priority and that each person is accountable for making sure their area remains clean and well-kept.

Properly Dispose of trash:

Provide and instruct employees to use proper containers for trash and waste. Liquids and chemicals must be stored in approved containers. Empty out trash and waste containers often enough to prevent overflow onto the floor.

- **Some specific requirements for housekeeping in the workplace, these include:**

✓ Stacking, piling, or placing scrap and debris in a container in a way that does not create a hazard to an employee.

✓ Keeping aisles, exits, and stairs clean and orderly by ensuring they are free from hazardous accumulations of scrap, debris, water, oil, grease, and other slip and trip perils, and maintaining a clear aisle way for walking and transporting materials.

✓ Providing drainage or a false floor, platform, or mat in wet process areas.

✓ Providing a slip-resistant surface where employees are required to walk on a wet surface.

✓ Keeping storage areas free from accumulations of materials that could create a hazard from fire, explosion, or pest infestation.

- **Selection and Use of Work Practices**

  you must ensure that employees performing work near or on equipment or circuits that are, or may become, energized utilize electrical safety-related work practices. These practices are intended to prevent electrical shock or other injuries to your employees resulting from either direct or indirect electrical contacts .De-energize live parts to which an employee may be exposed before allowing an employee to work on or near those parts. Work on or near live parts is permissible if it can be demonstrated that de-energizing isolates the parts and protects the employee from coming in contact either directly or indirectly with some other conductive objects

  - **Work Practices/Procedures**

    If you ask employees to work on or near an exposed de-energized part and the employees may be exposed to electrical shock if equipment is re-energized requires that you develop and utilize a procedure to lockout and tag equipment at the electrical source to prevent reenergizing the equipment. Chapter 32 provides further detail on lockout and tag out procedures.

    If a lock cannot be used or the employer can demonstrate that tagging procedures will provide safety equal to a lock, a tag may be used without a lock. In these cases, all of the following must occur:

    • the tag must be of a distinctive employer design that clearly prohibits authorized energizing of the circuits and removal of the tag.

    • A tag shall not be used without an additional safety measure such as the removal of an isolating circuit element, the blocking of a controlling switch, or the opening of an extra disconnecting device.

    • All persons who have access to controlling devices shall be trained in, and familiar with, the employer's tagging procedures. Requires the employer to develop a written lockout procedure.

    • The situation must meet the requirements of the MIOSHA General Industry Safety

Self-Check -3	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

11. _____ is the process collection of data for dealing with the individual's or the organization's/communities', etc. current situation. (**3 points**)

J. Analyzing information C. Data

K. Interpreting information D. Gathering information

12. List out the sources of additional information gathering.(**4 points**)

Note: **Satisfactory rating –3 and 4 points** **Unsatisfactory - below 3 and 4 points**

You can ask you teacher for the copy of the correct answers.

Information Sheet-4	Notifying completion of the installation work

4.1 Supervise of the installation antenna Work

Before any completed installation, or an addition/alteration to an existing installation, may be connected to the supply all such installation work must be inspected and tested in order to comply with national regulations (EBCS-10 in Ethiopia's case). Any such tests that are to be made should be such that no danger to persons or damage to property can occur Prior to conducting any inspection and testing, the person or persons who are to undertake this task must be provided with all the drawings, charts, tables and specifications associated with the installation This is in order that the type and composition of circuits, protective devices used, methods of earthing, presence of sensitive electronic devices, location of switchgear and equipment may be determined In other words, full knowledge of the installation must be established in order to know which tests are required, and whether any special conditions apply to that installation.

- Installation to Comply with This General Specification

  The broadcast reception installation shall comply with this General Specification which details the intrinsic properties (including materials and workmanship) of the installation, in so far as it is not overridden by the General Conditions of Contract, Special Conditions of Contract, Particular Specification for the Works, Drawings and/or written instructions of the Architect.

- **To test electronics antenna testing**

The electrical contractor is charged with a responsibility to carry out a number of tests on an electrical installation and electrical equipment. The individual tests are dealt with in Part 6 of the IEE Regulations and described later in this chapter.

The reasons for testing the antenna installation are:

- ✓ To ensure that the installation complies with the Regulations,
- ✓ to ensure that the installation meets the specification,
- ✓ to ensure that the installation is safe to use.

Those who are to carry out the electrical tests must first consider the following safety factors:

- ✓ An assessment of safe working practice must be made before testing begins.
- ✓ All safety precautions must be put in place before testing begins.
- ✓ Everyone must be notified that the test process is about to take place, for example the client and other workers who may be affected by the tests.
- ✓ Permits-to-Work' must be obtained where relevant.
- ✓ All sources of information relevant to the tests have been obtained.
- ✓ The relevant circuits and equipment have been identified.
- ✓ Safe isolation procedures have been carried out – care must be exercised here, in occupied premises, not to switch off computer system switch out first obtaining permission.
- ✓ Those who are to carry out the tests are competent to do so.

The electrical contractor is charged by the IEE Regulations for Electrical Installations to test all new installations and major extensions during erection and upon completion before being put into service. The contractor may also be called upon to test installations and equipment in order to identify and remove faults. These requirements imply the use of appropriate test instruments, and in order to take accurate readings consideration should be given to the following points:

- ✓ Is the instrument suitable for this test?

- ✓ Have the correct scales been selected?
- ✓ Is the test instrument correctly connected to the circuit?

Many commercial instruments are capable of making more than one test or have a range of scales to choose from. A range selector switch is usually used to choose the appropriate scale. A scale range should be chosen which suits the range of the current, voltage or resistance being measured.

Self-Check -4	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. _____ the reasons for testing the antenna installation are. (3 points)

A. To ensure that the installation complies with the Regulations,

B. to ensure that the installation meets the specification,

C. to ensure that the installation is safe to use

D. All

Note: **Satisfactory rating –3 points** **Unsatisfactory - below 3 and 4 points**

You can ask you teacher for the copy of the correct answers.

List of Reference Materials

- **https://www.youtube.com/watch?v=XOdPJDSTvjM**
- **Electrical installation designs _2nd_edition**
- **guidelines for electrical wiring in residential buildings**