

WICEN (Northern Rivers)

OCCUPATIONAL HEALTH and SAFETY

INDEX

Page	Subject
6.2	Contents - Travelling, On Station, Tools, Comfort, Leaving, RF Exposure
6.3	Carry bars, Loads, Long Poles, Back Seats, Station Wagons, Storage, Lifting.
6.4	Mounted Radios, Location, Tree Limbs, Layout, Tripping, Preparation, Gear Check, Masts. .
6.5	Planning, Wires, NVIS, Public, Falling Objects, Strong Winds, Storms.
6.6	Earthing, Tools - Correct, Housing, Location, Comfort, Stability, Environment.
6.7	Insects, Sun/Wind, Posture, Smoking, Leaving, RF Exposure etc.
6.8	UHF / SHF Quarter Waves, Soft RF Susceptible Tissue, Learning Outcome 6 - OH&S.

Webmaster's Notes:

The following information has been extracted from the WICEN (NSW) Inc. Manual - WICEN Training Manual, Operator (NTS001) Ver. 1.5 of 15/1/2000.

The text has been retained but the formatting has been condensed to reduce the number of pages for downloading.

These Methods and Information should be quite adequate to give Operators enough basic knowledge and skills to enable them to carry out their duties and responsibilities in a competent and efficient manner.

Working safely is probably more important than working at all.

You will be of no assistance to the situation if you become a casualty or your equipment is rendered useless because of careless installation or conduct of your task.

Valuable time and resources will be wasted correcting the situation to the detriment of other tasks.

Insist on correct actions and procedures by all those working or being in your vicinity.

If an urgent set up was needed, tidy it up immediately when possible to avoid a later failure or accident.

Time spent setting up correctly and safely will give efficient, comfortable working with less fatigue.

Carelessness might result in injury, liability or loss of compensation for yourself or others.

DO IT RIGHT, FIRST TIME.

WICEN (originally Wireless Institute Civil Emergency Network) is an organisation of Amateur Radio operators throughout Australia. Their time and facilities are made available to the authorities in times of emergency and also for civil benevolent and safety operations at other times.

This extract is by WICEN (Northern Rivers) Region based in Lismore, North Eastern New South Wales. See our page and associated pages at -

WICEN (NR) <http://www.phonetic.org.au/alphabet.htm>

Also SARC <http://www.sarc.org.au>

Phonetics at <http://www.phonetic.org.au/alphabet.htm>

Please send feedback or comment to - vk2jwa@sarc.org.au

I hope you find this useful, 73, John Alcorn, VK2JWA
Coordinator,
WICEN
(Northern Rivers)
Lismore, 2480.
NSW. Australia.

OCCUPATIONAL HEALTH and SAFETY

Within WICEN (NSW) Inc.

Contents:

1. Whilst travelling

- 1.1 Carry bars
 - 1.1.1 Load security
- 1.2 Back seat
- 1.3 Back of the wagon
- 1.4 Storage
 - 1.4.1 can you lift it?
- 1.5 Mounted transceivers

2. On station

- 2.1 Location
 - 2.1. 1 limbs
- 2.2 Laying out the equipment
 - 2.2.1 tripping over it
- 2.3 Preparation
 - 2.3.1 gear check
- 2.4 Erection of masts
 - 2.4. 1 planning
 - 2.4.1.1 What of the wire
 - 2.4. 1.2 NVIS
 - 2.4.2 the public
 - 2.4.2.1 Falling objects
 - 2.4.4 strong winds
 - 2.4.5 storms
 - 2.4.5. 1 earthing
 - 2.4.5.2 NVIS
- 2.5. getting it down
- 2.6 Makeshift

3. Tools

- 3. 1 Condition
- 3.2 Correct tool for the job
- 3.3 Proper housing
 - 3.3.1 where did I put it?

4. Making yourself comfortable

- 4. 1 Legs
- 4.2 Environment
 - 4.2. 1 insects
 - 4.2.2 sun
 - 4.2.3 wind
- 4.3 Posture

5. On leaving

- 5.1 Tidy the area
- 5.2 Properly repack the vehicle
- 5.3 Advise someone of your intended path

6. RF exposure guidelines

- 6.1 Susceptible Human tissue at VHF
- 6.2 RF confinement
- 6.3 Non intermittent operations
- 6.4 Shielding RF
- 6.5 UHF/SHF 1/4 wavelengths
- 6.6. VHF soft tissue

1. Whilst travelling.

Much of the WICEN operators time is spent in travelling with equipment within and atop the vehicle and the method used to carry this often quite heavy load is very important.

1.1 Carry bars

The type and strength of these bars or rack is important.
It is particularly important that the rack is well secured to the vehicle.

1.1.1 Your load

Load security can only be achieved when properly tied. Too often the load is poorly secured with improper knots. The use of flexible straps is common and these should not be used on retaining loads that are in excess of the straps ability to restrain, especially under severe braking of the vehicle.

1.1.2 Long poles

These can be a problem especially if they are steel and contain some weight.
It is important that they can be loaded and unloaded safely and not be a cause of physical injury.

Because of their weight, stresses on the rack are greatly increased when the vehicle is under brakes or swerves sharply.

1.2 Back seats

Back seats are a common environment to carry equipment, especially if that equipment is somewhat fragile and it is thought that the seat will absorb the road shocks.

Whilst this is true, most people do not have the means to retain the equipment, if there is a need to brake or swerve sharply, the equipment can cause injury to occupants of the vehicle including damage to the equipment

If there is no restraining method available, the use of the back seat should be avoided as untethered equipment can be flung toward the front of the vehicle causing injury.

1.3 Station wagons

If the station wagon has a well mounted mesh frame to limit the mobility of flying objects and equipment, then injury to occupants of the vehicle is not of consideration. If however the vehicle is not fitted with such a frame, there is still a strong likelihood of equipment being thrown about causing injury to the occupants when the vehicle is required to swerve sharply or brake severely.

The use of a properly designed retaining mesh that is securely attached to the vehicle when covering the load, will prevent the equipment from breaking free.

The use of a retaining mesh for rear storage in a station wagon or similar vehicle is very desirable.

1.4 Storage

An important aspect in reducing personal injury is to limit the weight that you must carry especially if that weight requires side lifting or pulling.
It is far better to have more items to carry of less weight than it is to carry a larger weight.

1.4.1 Can you lift it?

Place the equipment in strong boxes or plastic containers that can be easily grasped for lifting, do not pull sharply and do not lift heavy weights whilst you are in an awkward position.

1.5 Mounted transceivers

A short note on the structural dependability of transceivers in vehicles.
Too often radio equipment is lying around on the floor of the vehicle or is poorly attached.
The same condition arises if the vehicle needs to take evasive action.

Equipment mounted behind the driver or passenger should be securely attached to the mounting material that in turn is securely attached to the vehicle.

2. On Station

2.1 Location

Often, the choice of location is limited, but there needs to be some consideration to possible dangers or hazards

2.1.1 Limbs of trees.

A very real danger can exist from falling tree limbs.

Certain species of eucalypt, when exposed to certain weather conditions can drop limbs or even loose root footing causing the tree to fall.
These are the often large trees that grow around rivers, mainly White, Manna and Redwood gums.

Dead limbs should be avoided, do not set up or place any equipment beneath these.

Be extra cautious after rain.

2.2 Laying out the equipment

It is often a good idea to lay out your equipment in a neat fashion so that all the gear can be obtained and items clearly seen, much frustration can be avoided using this method even if it does mean a certain amount of reloading.

2.2.1 Tripping over it.

When laying out the gear, place it in a spot that will not cause you to have to step over it.
Select a spot clear of dangers as discussed and not too far away as the gear for the gear to be carried.

2.3 Preparation.

Plan what you need to do first. Often there is a need to establish radio contact quickly and this may be your first concern but don't rush into it.

If you do have contact from the whip on the vehicle, perhaps only to your neighbour, this may be sufficient for you until you have completed all the other tasks and without haste.

In all events you are instructed to be on site usually within 90 minutes to start time, this should be plenty of time to set up your station without fluster and still have a cuppa..

2.3.1 Gear check.

The first (or maybe the second, after a cuppa) is to lay out the gear and check it for completeness.

If incomplete you may be able to rig something or take another approach, knowing early in the set up is important as it will reduce panic and give you time to think or ask questions etc.

2.4 Erection of masts.

Care and planning of mast erection is important. If you have a light weight aluminium sectioned mast you will still need to consider how to keep it upright, especially if you are on your own.
You will require sufficient space for maximum anchorage and use appropriate guying material and pegs.

2.4.1 Planning.

If you have a sectioned steel mast or even a long length of steel section, you should not be on your own. There are methods that can be used for individual erection of such masts but in the matter of safety, you should have assistance.

Lightweight masts, if they fall, will not cause as much damage as the steel section, are easier to control and may be erected singularly.

Plan the placement of the mast, the area required for guying and consider the consequences if it happens to fall, is it near other people or equipment vehicles etc.

2.4.1.1 What of the wire.

If you erect a dipole, there is little chance of the public getting tangled in its ends, maybe the middle though, make sure the feed wire is not in the public's path. If you erect an inverted V, there is plenty of scope for the public to get entangled in the ends, you will need to enclose the ends with a suitable tape suggesting to the public that this area is out of bounds.

2.4.1.2 NVIS. (Near Vertical Incident Skywave)

It is appropriate at this time to mention the V dipole, a Near Vertical Incident Skywave antenna that has raised ends and a tuned low to ground feed line, this will mean the public have little chance of getting foul of the antenna unless they are in your lap!

2.4.2 Public

If you are to erect a mast of some height in and around the public, you can be sure that it will not go unnoticed, the public will want it erected with regard to their safety and yours.

Multi sectioned steel masts of up to 30 feet or 10 meters can be pushed up by a single person but unless you can hitch it to some strong safe section of the vehicle, you will not be able to leave it and guy the mast into place.

If you have another person to assist in this matter, it is still preferable to be able to tie well the mast firmly to a section of the vehicle.

It is preferable to have the guys pre-cut to a proper length and to know how many of your steps from the foot of the mast the pegs need to be placed, it is then possible to push the mast into place, watching the guy ropes come into near taught as the mast reaches vertical, (3/4 guy method). . Attach the mast to the vehicle if possible then a quick run around the guys and pegs to tighten and the public will be well pleased with your efforts.

2.4.2.1 Falling objects.

There have been a number of instances where either a vehicle's bodywork or the windscreen has suffered from a falling spanner or nut.

DO NOT throw an object over a limb of a tree without first checking the surroundings for safe re-entry, well guided throw or not.

2.4.3 Strong winds.

A well supported mast will be quite safe in strong winds but this pre supposes that you have anchored the base, used good strong rope, it need not be large in size for this. Properly tied guys atop the mast pegs will not be easily withdrawn from the ground

2.4.4 Storms.

Whether wind or atmospheric (Thunderstorm), care must be taken in regard to your location. For the former, a windbreak is required, this may be natural or it may need to be manufactured by you, and, if manufactured, some care will need to be taken as to the strength and viability of the structure. If you have a vehicle then you have your protection.

If the storm is electrical in nature then special needs are to be met.

2.4.4.1 Earthing.

Connect all transceivers, ATU's etc to an earth stake as close as possible to the equipment. Run your coax from the dipole to the ground and then bring the feed along the ground to the equipment. At the right angle bend in the coax, it is a good idea to use a joiner which incorporates an earth connection and connect this joiner earth to a separate ground stake.

2.4.4.2 NVIS

In the event of having to operate during storm conditions, use of wire aerials run near to or along the ground via an ATU (NVIS) is far more favourable. For 80 meters, an 85 ft. Wire length giving a broadside field is satisfactory.

The ATU must be earthed along with the other side of the balanced line.

2.5 Getting it down

Lowering a heavy mast can be a hazard. Be sure that there is nothing in the path of the mast in the direction in which it is to be lowered. Leave the guys in the opposite direction attached and have your partner use one of the guys in assisting the lowering by taking some of the load of the mast.

To take the load of the mast it is best done by removing from the peg or anchor, the guy that is going to be used. Lengthen it sufficiently so as to enable the rope to be placed twice around a small diameter steel section of the vehicle (bull bar). Feed out the guy until the mast is down. This will provide a degree of leverage and greatly assist with the lowering.

2.6 Makeshift

Makeshift can be extremely dangerous when dealing with masts, especially of the heavier steel section. Anchor points for the guy ropes to the mast is important, if you use nylon rope make sure that it is bound so that it will not unravel the knot.

Poor guy rope must not be used

Pegs must be suitable, if not, it is possible to bury a log or use the vehicle as the tie point. Unless the makeshift is sound, try another system.

3. Tools

A tool or implement is involved in all we do.

Tools come in many different forms, shapes, sizes, and danger to the user.

Some considerations in regard to proper care of tools are given below.

3.1 Condition

Care must be taken with all tools, all tools should be kept in good condition, a poorly kept implement is a hazard, blunt knives require extra effort and as a result, slippage and possible severe injury can result.

3.2 The correct tool.

Often, we select a tool that will do the job in some fashion, but it is not the one designed for that application. A case in point is the use of a shifting spanner to loose quite tight nuts, more often than not, the tool will damage the nut if it has not already skinned your knuckles.

Some examples that are close to home for many WICEN amateurs:
incorrect striking implement,
spanners in trees, general tools in tree forks.
Using a knife for cutters etc.

There are many instances of the incorrect tool being used and perhaps much of this is unavoidable, but I'm sure in many instances, the real reason is an apparent difficulty in obtaining the correct one, we might have to get up from what we are doing and look for it!.

3.3 Proper housing.

A very sure method to reduce injury to oneself or others is to have the tool retained in its proper housing. A sheath for knives, axes, saws or any other sharp instrument. Often there is a need to construct some sort of housing for certain tools, a wood plane comes to mind.

3.4 Where did I put it?

Every tool has a home!, this should be the case and a case, bag, or box is a fair home at that.

If you take the care to sheath sharp tools and replace them in their container-home, you will reduce the risk of injury to yourself and others, especially children enormously, and reduce the risk of losing the tool.

4. Making yourself comfortable.

It is desirable that you be comfortable whilst on station.

These days with folding tables, chairs, all manner of aids to keep sun, flies and various other things at bay, there is no reason why you should suffer an on station job.

4.1 Legs.

Idyllic setting?, Even so there are dangers lurking. How serviceable are those table and chair legs, do they fold up for no apparent reason, if so what can be done about it.

Will the table you have brought along manage the weight of the HF transceiver, the VHF unit and your arm weight together?.

Though the card table folds away well, it must be remembered that it is not designed for weight let alone anyone nudging it!.

4.2 Environment.

Sometimes the location we are sent to is an idyllic setting, no problems exist, other times it is right out in the bush on a hot summers day, far from idyllic when you have ants, snakes, flies, mosquitoes, leeches etc.

4.2.1 Insects.

There is a need to keep insects from attacking you from at least two quarters, flying and ground mobile. The use of an insect repellent is very necessary, make sure it is one that agrees with your skin and is effective.

There is not a lot that can be done with ants except make sure you are not too close to an ant nest, clear away the scrub and give yourself some room to move without tripping over yourself, you will see them easier!.

Keep food well out of the way and be careful with your food scraps, perhaps they can be left some distance away and drive the ants to it.

4.2.2 Sun / Wind.

Protection for yourself using creams, cover up and head cover, ensure that you have placed yourself in a wind break if possible, if not, use some plastic sheeting to protect yourself from the wind.

Severe burning of the skin can occur with a hot wind. Cold winds of course are very dangerous as well, you must be well protected from cold and a windbreak is essential.

4.3 Posture.

It can be long hard day if you are uncomfortable, make sure you are happy with your folding chair, that the table is the right height for you, spend some time to ensure that you are comfortable as it often is a long day out there.

4.4 Smoke free environment.

Most people do not smoke. Some people are adversely affected by cigarette smoke. WICEN has a policy regarding smoke free environment.

5. On leaving.

When all is packed away look around the area for plastic, paper or any mess you may have created and clean it up.

Make sure the vehicle is again properly and safely packed and ensure you have told the net control of your real route on leaving.

6. RF exposure.

Potential exposure situations should,be taken seriously.
ANSI C95.1-1982 advises that frequencies between 30 MHz and 300 MHz should be avoided by body lengths of around 0.4 wavelength.

6.1 Never operate a mobile rig of 10 watts or more RF power if anyone is near the antenna

6.2 RF confinement

Confine RF radiation to antenna radiating elements themselves. Provide a good single station ground and eliminate radiation from transmission lines.

6.3 Non Intermittent operations

With radiation of the type found with RTTY and high incidence Packet operation, try to avoid human presence near antenna ends.

High power into vertical monopole antennas requires humans to be no nearer than 3 - 4 meters with non-intermittent transmission.

6.4 RF Shielding

Ensure that all VHF and UHF power amplifiers are operated with covers on.

6.5 UHF/SHF $1/4 \lambda$

In this frequency region, never look into the open end of an activated length of waveguide or point it at anyone

Never point a high gain, narrow beamwidth antenna toward people!

6.6 Soft and RF susceptible Human tissue

Do not operate higher power Hand Held transmitters with the antenna tip and base close to forehead and eyes. It is preferable to operate using a speaker mike and an external antenna.

Don't work on antennas that have RF power applied.

Learning Outcome 6: Demonstrate safe working practices.

Assessment: Written test.
Practical demonstration.
Continuous assessment.

Performance: a. Obtain 100% in the written test.
b. Demonstrate safety at all times.