VKS-737 & HF-Tel
Divisions of the Australian National 4WD Radio Network Inc.

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ABN 92 486 729 762

PO Box 2101
Elizabeth Park. SA. 5113

www.vks737.on.net
email: info@vks737.on.net

Telephone: **(08) 8287 6222**
Facsimile: **(08) 8287 1255**

VKS-737 Operating Essentials

Introduction

How confident are you at calling the VKS-737 Base Stations during sked times?

Do you know how to call the VKS-737 Base Stations outside of sked times?

Are you brave enough to pick up the microphone and talk let alone send a selcall?

Every VKS-737 Network subscriber must be able to effectively speak on, and understand the operation of their radio.

To do this efficiently, requires knowledge of both Standard Radio Operating Procedures and Professional Radio Operating Procedures!

Most new subscribers are very nervous the first few times they use the radio however this problem is generally overcome with time, listening to other subscribers and base stations and actual "on-air" practice.

Your HF radio is just another safety feature that you carry in your vehicle but it is also a great way of keeping in touch with other VKS-737 Network subscribers and both aspects can go together very successfully.

The more you use your radio, the easier it becomes, the more comfortable you will be, and most importantly you will know exactly how to make that emergency call if the need arises – and let's not forget that the safety aspect is the reason that the VKS-737 Radio Network exists.

The majority of modern radio systems are of telephone quality. However, we use Professional Radio procedures for the following reasons:-

- Radio Communications may suffer from interference, from many sources which can result in poor reception and misunderstood messages.

- Communication is only possible in one direction at a time and chaos could result if two or more persons use the same frequency to transmit at the same time.

- In emergency or in poor operating conditions radio traffic transmissions can become congested and accuracy can suffer.

- Radio is a multi-user communications facility which requires listening before transmitting and consideration of other subscribers.

- The radio channels used in the network are a finite resource and adherence to Professional Radio Procedures ensures the network's most efficient use.

Professional Radio Operating Procedures are designed to ensure:

- Brevity
- Accuracy
- Speed
- Simplicity

When using radio, there is no substitute for common sense. Clear speech assists reception and avoids the need for repetition or correction. Hold the microphone close to your mouth and talk across it (not into it).

The following factors will assist in achieving successful transmission of messages:-

Rhythm

Ordinary conversation has a natural rhythm which needs to be preserved when speaking on radio.   Say messages in short complete phrases that make sense, not -word-by-word.   Avoid using overflows like 'you know' or "er".

Speed

Speak slightly slower than in normal conversation, Avoid rushing, or slurring words. Pause between phrases to give the receiver time to write down the message. Pause about one second after pressing your Press-to-talk' button and speaking to allow time for the receiver station to allow your transmission to proceed.

Volume

Speak slightly louder than normal conversation. AVOID SHOUTING.

Pitch

Use a normal or slightly higher pitched voice.

Transmission Principles

- Radio communications are multi-user facilities and require adherence to a number of basic principles when transmitting as follows:

- Listen before transmitting.

- Keep messages short and concise.

- Urgent or priority messages must be transmitted expediently, without dramatisation.

- Unusual person or place names may be spelt by using the phonetic alphabet.

- Long messages should be broken into natural sentences.

- If messages are required to be written by the receiving operator, the message should be transmitted at writing speed.

- Avoid the use of jargon terms.

- Do not use profane language.

Phonetic Alphabet

The Phonetic Alphabet is a standard procedure for the transmission of difficult-to-pronounce words, names or place names by spelling them. This alphabet is also used for car registration numbers, grid references and other easily mis-understood words.

The over-use of the Phonetic Alphabet wastes on-air time.

Always use the Pro-word '**I Spell**' when about to use this alphabet.

Letter	Code word	Pronounciation
A	Alpha	**AL**-fah
B	Bravo	**BRAH**-voh
C	Charlie	**CHAR**-lee
D	Delta	**DELL**-tah
E	Echo	**ECK**-oh
F	Foxtrot	**FOKS**-trot
G	Golf	**GOLF**
H	Hotel	hoh-**TELL**
I	India	**IN**-dee-ah
J	Juliet	**JEW**-lee-ett
K	Kilo	**KEY**-loh
L	Lima	**LEE**-mah
M	Mike	**MIKE**
N	November	no-**VEM**-ber
O	Oscar	**OSS**-cah
P	Papa	pah-**PAH**
Q	Quebec	keh-**BECK**
R	Romeo	**ROW**-me-oh
S	Sierra	see-**AIR**-rah
T	Tango	**TANG**-go
U	Uniform	**YOU**-nee-form
V	Victor	**VIK**-tah
W	Whisky	**WISS**-key
X	X-Ray	**ECKS-RAY**
Y	Yankee	**YANG**-kee
Z	Zulu	**ZOO**-loo
0	Zero	**ZEE**-row
1	One	**WUN**
2	Two	**TOO**
3	Three	**Thuh-ree**
4	Four	**FOW**-er
5	Five	**FIFE**
6	Six	**SIX**
7	Seven	**SEV**-en
8	Eight	**AIT**
9	Nine	**NINE**-er
10	Ten	**WUN-ZEE**-row
.	Decimal Point	**Day-see-mal**
,	Comma	**Comma**
.	Full Stop	**Full-Stop**
-	Hypen	**Hy-phen**

Emphasis on pronunciation is shown in bold

Figures must be spoken slowly and with the correct pronunciation.

All figures, with the exception of exact multiples, e.g. One hundred or one thousand must be spoken separately. (i.e. wun-zero = 10, thuh-ree-zero = 30)

Map Grid References should be sent numeral by numeral preceded by the Pro-word GRID.

Always pause between "eastings" and "nothings" when sending Map Grid References.

Pro-words

Pro-words are pronounceable words or phrases which have been assigned meanings for the purpose of expediting message handling where radio procedure is employed.

In no case should a pro-word or a combination of pro-words be substituted for the textual component of a message.

Under no circumstances should subscribers make up their own Pro-words.

The following is a list of pro-words for VKS-737 Network use:

Pro-word	Meaning
Affirmative:	Yes
All After:	The portion of the message to which I have reference is all that which follows word stated
All Before:	The portion of the message to which I have reference is all proceeding the word stated
Clearing With (callsign)**:**	This is the end of my transmission to -- ----- and I do not require a response.
Correction:	An error has been made in this transmission. The message will continue with the last word correctly transmitted.
Distorted:	Cannot understand your transmission as the signal is distorted
Do you copy:	Did you receive and understand my transmission?
I Spell:	I shall spell the next word phonetically
More To Follow:	I have more to say as part of this transmission after this pause, do not use this frequency unless urgent.
Negative:	No
Nothing Heard	To be used when no expected reply is received
Out:	This is the end of my transmission and I do not require a response.
Over:	This is the end of my transmission to you and a response is necessary. Go ahead and transmit.
Sitrep:	A situation report is required (to be sent).
This is (callsign)**:**	This transmission is from the station whose callsign follows
Unreadable:	The quality of your signal is so bad that I am unable to understand you.
Roger:	I have received your transmission, understood it and will comply.
Say Again:	Repeat all of your last message.
Send:	I am ready to receive your transmission.
Stand By:	I am not ready to accept your call, I will call you shortly.
Word After:	The word in this message to which I refer is that which follows ---------
Word Before	The word in this message to which I refer is that which precedes ---------

Exercise Traffic.

During training and exercises transmissions should be periodically prefixed with 'This is an exercise'. In the event of a real emergency situation developing, radio transmissions should be prefixed with 'This is not an exercise'.

Four Figure Time (24 hour clock)

The 24 hour time system is used in radio communications as it dispenses with the use of a.m. or p.m.

The first two figures of the group represent the hours, and the second two figures of the group represent the number of minutes past the hour.

The group is always followed by the word 'hours'.

Example:		
12.03 a.m.	-	0003 hours
1.17 a.m.	-	0117 hours
11.35 am.	-	1135 hours
1.15 p.m.	-	1315 hours
11.59 p.m.	-	2359 hours

Radio-Checks and signal reports

Radio checks are particularly important to both test radio equipment and to establish your location and safety.

When testing your radio or logging into a base station operator on any frequency it may be necessary to exchange signal strength reports with each other.

Signal strength reports are given as follows:

- **Loud and Clear** (100% readability).
- **Readable** (Good Readability 90 – 100%).
- **Weak readable** (Fair Readability 50 – 90%).
- **Unreadable** (Readability of less than 10%)
- **Nothing Heard** (No signal heard).

Call Signs

At all times subscribers are required to use their VKS-737 allocated callsign when operating on VKS-737 frequencies:

- Full Callsigns i.e. *VKS-737 Mobile 5291* must be given at the beginning and end of all transmissions, including Selcalls and Beacon calls, and at periods of no greater than 10 minutes during transmissions.

- Providing that the full callsigns are given at the beginning and end of a session, it is allowable to use the abbreviated Callsign i.e. *Mobile 5291* during transmissions.

- Callsigns should always be spoken slowly and clearly using the Phonetic alphabet, emphasis should be made on the numeric section of your callsign

Base Stations

A Base Station is responsible for network management which may include:

- Provision of Emergency assistance for users
- Transmission of emergency alerts such as cyclone warnings, bushfire alerts etc.
- Message handling
- Regular Scheduled Calls
- Network discipline.

Network Discipline.

To function effectively, radio networks, especially those used by Emergency Services, need to be operated in a disciplined manner.

Good network discipline requires that correct operating procedures be used at all times so that control is maintained.

Networks that suffer a loss of discipline degenerate to the point where they are unable to carry useful message transmissions.

Where network discipline has failed, a base station or a Network Control Operator must intervene and instruct all subscribers to cease all transmissions until called.

The base station or the Network Control operator then needs to re-establish the network ensuring that the previous improper procedures are eliminated.

Scheduled Calls (Sked Calls)

Regular scheduled calls sessions are established and maintained from selected Base Stations for the following reasons:

- To allow subscribers with non-selcall equipped radios to contact VKS-737 Base Stations.

- To allow subscribers report their location and status on a regular basis.

- To allow subscribers access to road condition reports and weather conditions upon request.

- To allow non-essential messages to be passed to and from subscribers.

Scheduled call times can be obtained from the VKS-737 Subscribers Reference Manual as well as the VKS-737 website.

Subscribers should be aware that scheduled call times change as a result of Daylight Saving in some states and territories.

Outside of scheduled call times the Base Stations maintain a selcall listening watch on all five frequencies.

There is no voice monitoring of the VKS-737 frequencies outside of scheduled call times.

Should subscribers need to contact a Base Station outside of scheduled call times it will be necessary for the subscriber to call the operator using selcall.

VKS-737 Base Stations are NOT equipped to respond to the Royal Flying Doctor Service (RFDS) Alarm Call system fitted to many HF radios – this system only functions on the frequencies assigned to the relevant RFDS Base Stations.

Transmit Timers

Many modern HF radios are fitted with a transmit timer to prevent transmissions for more than a preset period, usually one to three minutes.

Timers ensure that transmitters are not locked on continuous transmit by a jammed microphone button.

Good operating procedures will ensure that transmissions are brief and do not exceed the preset time-out period.

Radio Operating Conditions

Unlike making a telephone call where one can expect a relatively constant level of service, communicating by High Frequency (HF) radio can be extremely variable in the quality and strength of signals.

HF conditions vary considerably throughout the year and factors such as frequency, location, time of day, weather conditions etc. can have a major effect on the overall performance of a communications path.

Generally the spread of frequencies used by the VKS-737 Network and the locations of the Base Stations will allow some form of communications at most times.

Fading

Due to terrain or interference, radio signals may fade or become unreadable.

Fading is most noticeable when communicating with vehicles or portable radios.

Steps can be taken to improve radio communications when signals are deteriorating, these are:

- Request vehicles or persons to stop or relocate to a more suitable location

- Conduct radio checks until satisfactory communications are re-established, (a relocation of a few metres is sometimes sufficient).

Interference to Radio Signals

Interference is any effect that impairs the reception of a radio signal and can be natural, manufactured or a combination of both.

Natural interference is most noticeable on high frequency (HF) radio networks although Very High Frequency (VHF) and Ultra High Frequency (UHF) radio systems (such as 27MHz and UHF CB) may also be affected.

Natural interference is usually weather related and difficult to predict.

Some sources of natural interference are:
- Electrical storms
- Dust storms
- Rain
- Temperature inversions
- Ionospheric disturbances.

Manufactured (Man Made) Interference

Manufactured interference is usually caused by electrically operated machinery and appliances and may sound like buzzing, humming or high-pitched squealing.

This type of interference may be continuous or intermittent depending on whether the electrical devices are permanently operated or switched.

Subscribers should be aware that many vehicles, and the accessories fitted to them, generate interference that may disrupt radio communications and that it may be necessary to switch off the vehicle engine and other equipment to allow communication to take place.

Examples of manufactured interference are:

- High-tension powerlines
- Electricity supply systems and facilities
- Industrial machinery
- Computers and associated equipment
- Fluorescent lighting
- Neon lighting
- Electrically operated transport systems
- Vehicle ignition and control systems
- Mobile telephones and other radio communication systems.

Users of mobile or portable radio communications equipment experiencing manufactured interference should select alternative locations, free from interference.

Avoid using radios while under trees, near buildings, within industrial areas or under powerlines.

Message Procedure

The following points are to be noted when transmitting or receiving a message:

- Listen to ensure the frequency is not in use before commencing a transmission.

- Consider carefully what you wish to say before making a transmission.

- Transmissions are to be as short and concise as practicable, consistent with clarity.

- Always leave a three (3) second pause between transmissions to allow other subscribers or Base Stations to join into the conversation.

- Where possible messages should be written down prior to making the transmission. This ensures pre-thought of message content and facilitates accuracy when a repeat is requested.

- Transmissions are to be spoken in a natural voice, using sensible phrases, not word by word.

- If transmitting a message which the recipient will be required to type or write down, allow sufficient time between phrases for such writing, using phonetic alphabet where necessary.

- Always use the phonetic alphabet when transmitting vehicle registrations, unusual names and locations etc.

- If transmitting a long message, advise prior to commencement, and break your transmission at logical points to allow any other urgent transmissions.

- Always leave a three (3) second pause between transmissions to allow other subscribers or Base Stations to join into the conversation.

- Use four figure time (24 hour clock).

Selcall & Beacon Calls

Selcall is an abbreviation for **Selective Calling** which is a system allowing subscribers to send a call to a specific radio.

An analogy is to making a telephone call – when you dial a specific telephone number the called telephone rings.

If the receiving telephone has a Caller ID display then the telephone number of the calling telephone is displayed.

The caller using selcall sends out blocks of data comprising the 4 Digit selcall number of the station that is being called followed by the selcall number of the calling station, this is decoded by the receiving station to alert the operator of an incoming call, as well as giving the identification number of the caller.

When a selcall is received matching the number of the receiving station the radio responds by sending back an "Acknowledgment" (revertive) signal to indicate that the call has been received. This usually comprises either several short beeps or musical tones.

The sound of a selcall or a beacon call is not unlike that of a fax machine or a computer connected to the internet.

The sound of a selcall or a beacon call will disrupt voice traffic on the frequency and is very annoying to other users.

It is essential that subscribers ensure the frequency is free of any other traffic before sending a selcall or a beacon call.

Selcalls and beacon calls have NO priority over any other form of traffic and should only be used sparingly to prevent disruption to other traffic.

Beacon Calls

Beacon calls are an extension of a standard selcall and is used to test the signal conditions to another user or a Base Station.

There are two types of Beacon Calls:

- **xx99 Beacon** (used by VKS-737 Base Stations).
- **Selective Beacon** (used on most modern HF mobile radios).

To access a Base Station beacon (test call) the caller sends a selcall to the beacon number of the base station being called.

The beacon call number of a Base Station is the first two digits of the Base Station selcall number followed by "99".

To access a mobile radio Selective Beacon (test call) the caller sends to the normal selcall number of the particular radio, however instead of using the "send" command, the "beacon" command is used.

Selective Beacon requests MUST NOT be used when calling VKS-737 Base Stations.

Upon receipt of an incoming beacon request, the radio sends out a revertive signal which comprises either long tones or musical tones.

Neither the Base Station operator nor the user of the mobile radio are aware of an incoming Beacon request.

Receiving Selcall Calls.

By using Selcall it is possible to monitor one or more frequencies for incoming Selcall calls without having to listen to the normal conversations, noise and other interference that normally occur on HF channels.

This is achieved by setting your radio to the Selcall Mute mode, when a Selcall signal matching the number of your radio is received, the radio will revert to normal mode and the alarm will sound to advise you of the incoming call.

It should be noted that when scanning with Selcall mute selected you should generally scan no more than 7 or 8 channels, any greater number may possibly result in incoming signals being missed as the radio scans through the channels.

To send a Selcall:

- Choose the appropriate frequency to make your call on - as a general rule of thumb - the higher the sun the higher the frequency, the further the signal goes.

- Listen and ensure the frequency is free of traffic – sending a Selcall over the top of a conversation is disruptive and very annoying.

- If no traffic is heard, announce your callsign and make a verbal request as to whether the frequency is in use.

- If all clear, announce your Callsign and your intention to make a Selcall or Beacon call.

- Enter the appropriate Beacon or Selcall number and send the transmission.

- Listen for the revertive signal from the station being called. If you receive a good, strong revertive then you will be able to proceed with you call. If you do not receive a revertive, or if the revertive is very weak then you may need to try another frequency or another Base Station.

- Multiple Selcalls to a station does not make them answer any faster. Your call will register and they may call you back.

Calling a Base Station via Selcall

Many subscribers are unaware that when they selcall a Base Station they may be connected by a radio-telephone interconnect, via telephone lines, to an operator's home telephone located thousands of kilometres away.

Beacon (Test) Calls to the radio-telephone Interconnects MUST only be made by sending a SELCALL to xx99 (where xx is the first two digits of the Base Station)

Subscribers must NOT use the Selective Beacon (Beacon Call) facility on their radio to call Base Stations as the equipment interprets the selective beacon call to an Operators number as a normal incoming selcall and makes a telephone call to the operator assigned to that number.

Each of these Selective Beacon Calls costs the Network money, and disturbs the operators who answer the calls only to find nobody there. The matter is even more serious if a Beacon Call is made on a number allocated to an Emergency Service.

After selecting the best available channel (using Beacon) you can select the relevant Operator by using the selcall numbers listed in the VKS-737 Reference Manual.

Note:
- If the Base Station radio-telephone interconnect responds and the Operator does not answer his or her telephone then try another Operator until you are able to make a contact.
- If the matter is urgent try the selcall number for the relevant emergency service that you need assistance from.

Summary

The function of good radio procedure is to send and receive messages efficiently. While users should take pride in achieving a high level of competence, they should not use exotic procedures or jargon which could confuse other users on the network.

Kids, friends, family members and HF Radio

IT COULD BE YOU!

- Everything is fine and working and you are off on a great adventure.
- Disaster strikes.
- Dad's unable to use the radio!
- Mum doesn't know which knob to hit and the kids are too shaken to be of any use.

Lesson 1.

- ***Everyone in the vehicle needs to know how to use the radio.***

Lesson 2.

- ***After the accident it is too late to learn.***

Please make sure that everyone is familiar with radio use, radio procedure etc.

Take turns to log in, yes, kids too! They start by being nervous but soon get the idea and they often have the clearest voices on air.

Plenty of practice means that anyone can jump in when needed.

Emergency Contact while travelling

If Urgent, contact a base by selcall, or if you do not have selcall in your radio put out a voice call enquiring if any other member who can hear you could selcall a base station on your behalf. (If not urgent wait until the next available base station sked and log in)

WAIT to be connected, if you get no response from a base try again. If you are still unsuccessful try another frequency or base or both.

Have the following details ready to pass on to the operator.
- Your Name.
- Name of person to contact.
- Telephone number of person to contact.
- Message to be passed on.
- Whether you require a reply to the message.

Do not "hang-up" until the operator has confirmed all details, if you are expecting a return message ensure that you leave your radio on to receive the message.

In an EMERGENCY ask the operator for help.

Give appropriate details when asked, especially:

- The type of Emergency (i.e. breakdown, vehicle accident, medical emergency etc)
- Your Name and names of others involved in the emergency.
- Your Location
- Vehicle details (if applicable)
- Any other details as requested by the operator.

Do not leave your radio until the operator has confirmed all details,

Leave your radio on so that the operator and the relevant emergency services can contact you to obtain further information should this be necessary.

Messages to VKS-737 Subscribers

The VKS-737 Network offers a service where VKS-737 subscribers can have **IMPORTANT** messages passed to them from family & friends.

If you are travelling and are expecting family members etc to send messages to you please remember to give them the **Message Bank Service** number.

Telephone callers to this number CANNOT be directly connected to VKS-737 subscribers via the radio.

Please ensure that you explain to family and friends that this is a **Recorded Message Service**, messages are forwarded onto the Base Station operators for inclusion in the daily skeds.

Messages not collected by subscribers after 5 days are discarded from the system.