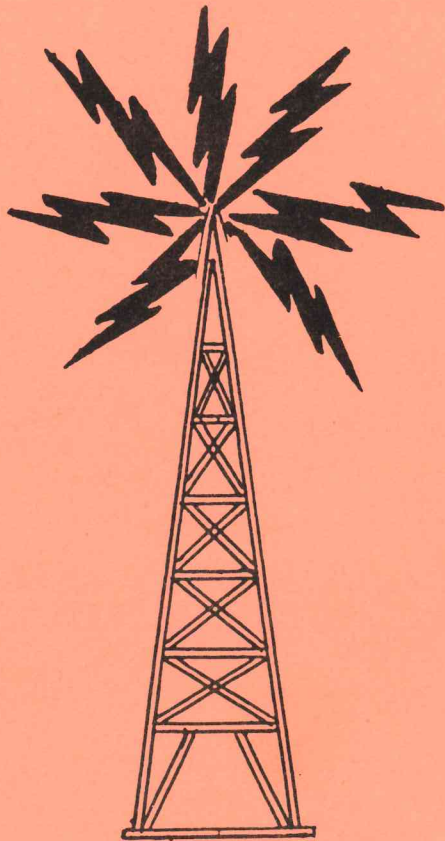Department of Conservation and Land Management W.A.

# RADIO

# COMMUNICATIONS

**FIRE PROTECTION BRANCH**

**COMMUNICATIONS BRANCH**

**OCTOBER 1986.**

# RADIO COMMUNICATIONS COURSE

INTRODUCTION:

Effective and reliable communications are essential to efficient fire suppression and the daily administration of the Department's functions. It is therefore vital that all personnel operating a two-way radio must be capable of sending information correctly and in a clear, concise manner.

These notes contain the standard procedure to be used by all operators when transmitting messages on radio circuits, with particular attention to:

    The regulations governing the use of two-way radio;

    The type of radio networks used;

    The facilities and operation of a radio;

    The care and basic maintenance of radio communications equipment.

    The correct voice procedures;

# CONTENTS

SECTION ONE

OPERATION OF RADIOS

## 1. DEPARTMENT OF COMMUNICATIONS (D.O.C.) REGULATIONS

Licences in accordance with the Wireless Telegraph Act are obtained from the Department of Communications for the establishment, maintenance and use of radio stations for communications between a control centre, vehicles, water- craft, and other mobile units.

The service is intended for promoting the efficient conduct of business operations, although use of the service for other purposes is not excluded.

Unless otherwise authorised stations in a network shall communicate only with stations licensed to participate in that network.

It is illegal to operate an unlicenced transceiver or without a licence for the particular frequencies authorised.

The licensee is responsible for the operation of the service and must ensure that its control is in the hands of competent operators.

It is illegal to include obscene or profane language in any transmission.

The operators of Marine HF and VHF radio equipments require a certificate of Proficiency in Radio Telephony in accordance with Department of Communications Regulations.

The annual licensing cost per unit currently vary from $35 (Mobiles) to $240 fixed stations.

## 2. MODES OF OPERATION

### 2.1 Electro-magnetic Spectrum

Radio waves form part of the electro-magnetic spectrum which comprises radio, heat, light, ultra violet, gamma rays and Xrays. The various forms of electro-magnetic radiation are all in the form of oscillatory waves, but differ from each other in frequency and wavelength. Notwithstanding these differences they all travel through space with the same speed – 300,000km per second (once around the world in one seventh of a second).

The waves are set up in the medium by an exciter acting as a transformer to convert the radio frequency power of the transmitter into electro-magnetic wave energy as efficiently as possible.

The transmitter antenna is the exciter, and its form must ensure that the maximum amount of energy is directed towards the receiver and that the intelligence carried by the energy is not distorted.

That part of the spectrum of electro-magnetic waves which is used for communication purposes has been classified into decades.  Two of these are considered here:

(1)   Very High frequency (VHF)     30-300 mega hertz per second
                                    10-1 metres wavelength.

(2)   High frequency (H.F.)        3000-30,000 kilo hertz per
                                    second. 100-10 metres wave-
                                    length

## 2.2   Wave Propagation

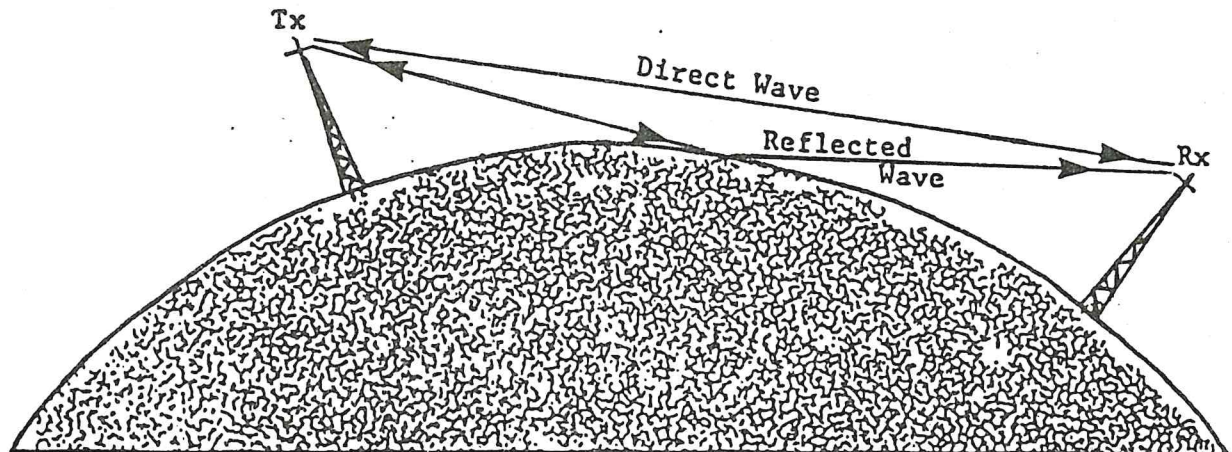### 2.2.3   The Space Wave          Very High Frequency



Figure 1:

Propagation between two antennas situated within line of sight of each other is shown in Figure 1.  Unless the antennas are very high or quite close together, an appreciable amount of the signal is reflected from the ground.  This combines with the direct wave to produce the signal received and is called the space wave.
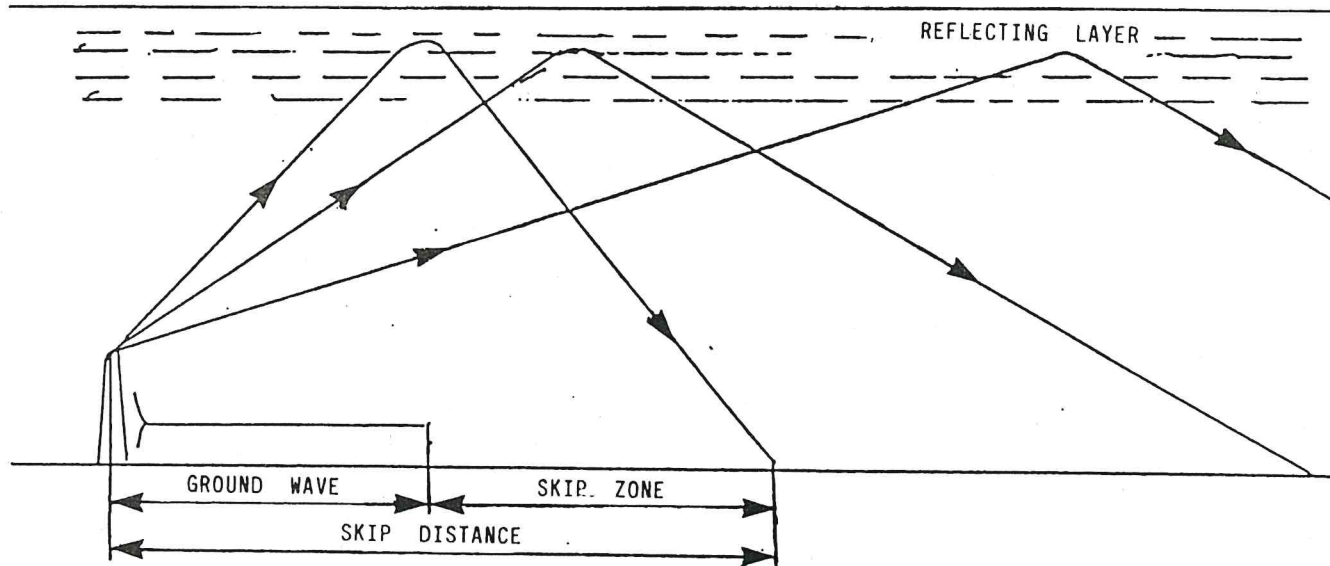
## 2.2.4  The Sky Wave          High Frequency



Figure 2:  Sky Wave Skip Distance

At frequencies below 30MHz, practically all communication over distances of 80km is carried on by means of the Sky Wave.  This is a wave which on leaving the transmitting antenna would travel on out into space if it were not reflected or refracted in the ionosphere to reach the earth again at distances varying from zero to 5000km in a single hop.  [Distances beyond this range would be accomplished by successive skips].  A station or mobile in the skip zone will receive weak, fading or no signal levels at all.

# 3.  COMPOSITION OF RADIO NETWORKS

## 3.1  (HF SSB) High Frequency Single Side Band

This network operates in the high frequency range (3 - 30 MHz).  In order to achieve some network efficiency six channel frequencies are available to enable communication throughout the State to take place over short to medium, medium to long distance, and under varying ionospheric conditions.

There are eight C.A.L.M. Regions, as well as S.O.H.Q., and nine National Parks that have fixed radio installations capable of operating to some 160 mobiles in the field.

In addition to C.A.L.M. operating frequencies the mobiles are fitted with the relevant Royal Flying Doctor service radio frequencies for field radio telephone service or to obtain assistance from medical resources, during or after hours.

In the near future S.O.H.Q. will have receivers operating in a remote forest area relatively free of man made noise.  It is envisaged that several channels will be monitored simultaneously.

### 3.2   (VHF FM) Very High Frequency Low Band

This network operates in the 70-85 MHz band of the very high frequency range.

Approximately 650 mobiles from 16 Districts operating in 6 Regions use this form of communication to transmit messages from vehicle to vehicle, vehicle to office, vehicle to aircraft, office to aircraft.  As VHF radio waves tend largely to follow a line of sight path, a "Radio" line of sight path can be obtained by using repeater talk through stations to increase the distance worked.  This method means that mobiles in poor locations are received by the repeater station and are automatically rebroadcast from the elevated point of the station.  The result is generally strong signals in the service areas for a range of 40-120km.  See Diagrams 3 and 4.  There are currently 6 channels available for operations in a half duplex mode. (2 frequencies per channel).

### 3.3   (VHF FM) Very High Frequency High Band

Radios on this network operate in the 160-170MHz band of the very high frequency range.  This network is used for smoke reporting only and is confined to district offices, lookout towers, LFO trailers and aircraft.  This system requires one frequency for channel operations and 3 channels are available.  The operation is simplex mode. (1 Frequency per Channel).

## 4.   TYPES OF RADIOS IN USE

### 4.1   VHF Network - Repeater Stations

There are two makes of repeaters operating on the C.A.L.M. network.

a)   STC - 25 WATT  RF output;

b)   Wormald 206  25 WATT  RF output;

The STC repeater is the one most used by the Department.  It has six channel capability, can be operated either locally, remote or by signal from a VHF mobile.  When triggered by a mobile transceiver it automatically goes into a receive-transmit mode and rebroadcasts the signal it has received. See Figure 4.

The Wormald 206 repeater is used solely at Gnangara Channel 2, its functions being the same as the STC, except the time out audible "Pip-Tone" (5 minutes) warning of repeater shut down is not available.
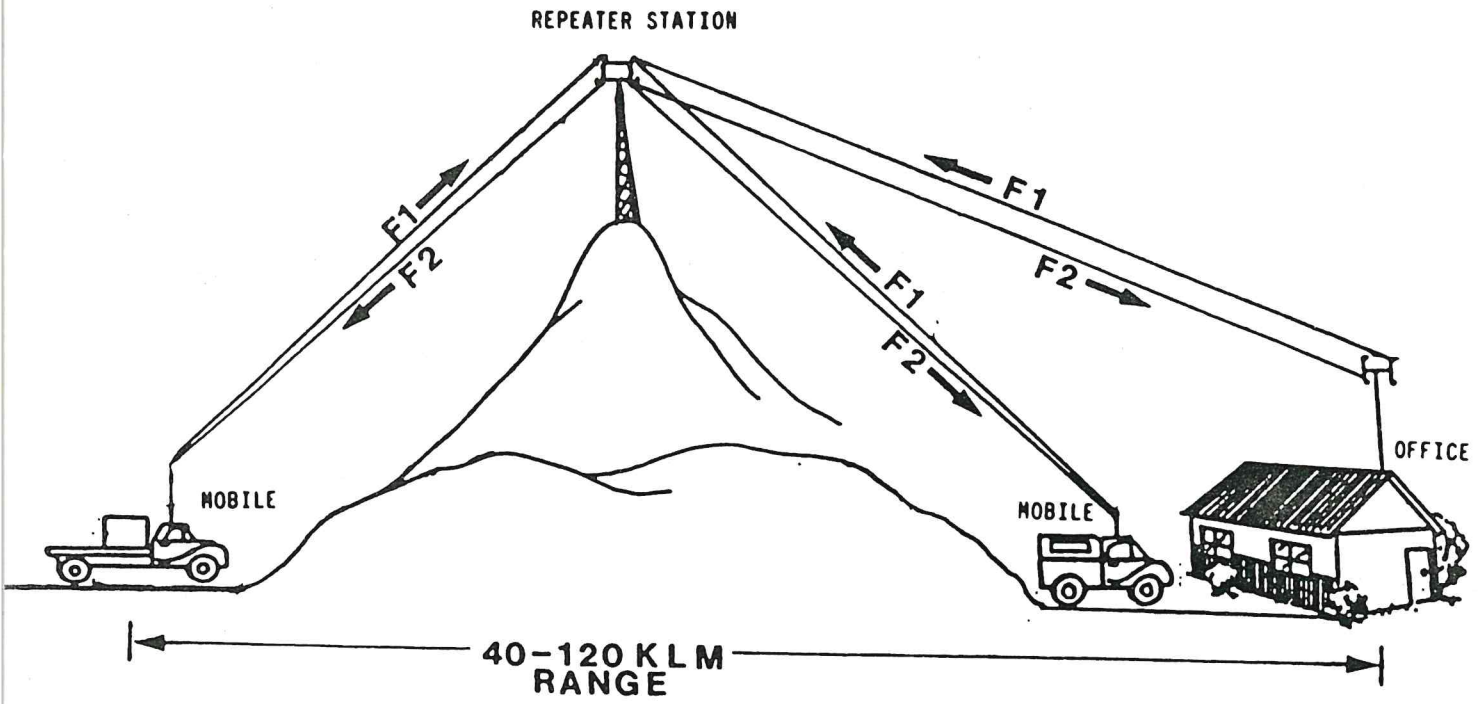
Figure 3:

REPEATER STATION

F1
F2
F1
F2
F1
F2

MOBILE

MOBILE

OFFICE

40–120 KLM
RANGE

Figure 4:

MOBILE

MOBILE

20/60 KM

REPEATER

DISTRICT HEADQUARTERS
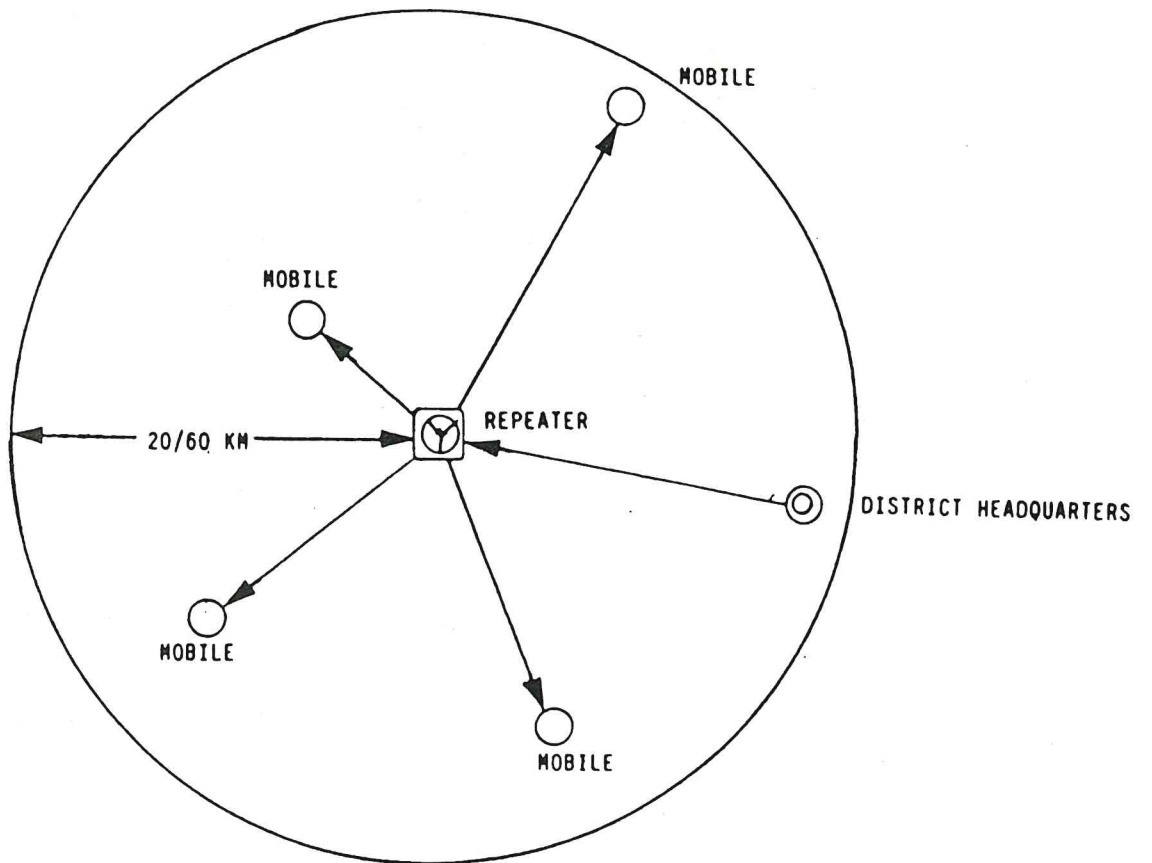
MOBILE

MOBILE

TYPICAL VHF REPEATER FUNCTION

DHQ CALLING TO MOBILES

4.2  VHF Network - Mobiles

There are four different types of VHF transceivers being utilized over the repeater network.

a)    AWA Fleetmaster - FM 731;

b)    Philips FM 828;

c)    Kimberley RFK 102L;

d)    Midland FM 70-066B.

They all have basically the same performance levels but differ widely as to options and specifications.

a)    The 731 cannot be used for simplex operations;

b)    The 828 has only one simplex channel available but is compatible to a Midland simplex channel 11 or 12;

c)    The 102L has only one simplex channel but is not compatible to Midland or Philips 828;

d)    The Midland 70-066B.  This radio is the modern "state of the art" transceiver.  It can be programmed to operate up to 80 channels and consequently this makes the Midland the ideal transceiver for Departmental operations.  The radio is usually programmed to operate in its scanning mode in accordance with District or Specialist Branch requirement.  Its scanning function is an electronic switch, which allows all the channels programmed for this option to be scanned for any transmission a number of times per second.  The radio will stop on the first transmission received and the operator has four seconds to answer before it reverts back to its scanning function.  The radio will always make its last channel received the priority channel.  This allows the called operator to answer without having to switch off the scan and manually change channel.  The radio will maintain that channel for four seconds (off scan) or until it receives another channel (on scan).

4.3   Channels Available

Channel  1 - 7     CLM repeater channels

Channel 11 - 17    CLM Simplex channels

Channel 21 - 29    BFB repeater channels

Channel 30         BFB Simplex country areas

Channel 31 - 36    BFB repeater channels

Channel 37 - 39    BFB Simplex 37 Swan, 38 Gosnells,
                   39 Rockingham

Channel 71 - 73    CLM - Technical checks

Channel 90 - 94 - 95   Fault information sequences.

It should be noted that the transceiver has a self checking function everytime it is switched on.  If the numbers 90, 94 or 95 appear and cannot be eliminated by switching the set on and off and on again the radio must be returned to Communications Branch for service.

4.4   Smoke Report Network (VHF Highband)

There are three different types of transceivers being utilized for this network.

a)   AWA  FM 721

b)   KIMBERLEY  RFK 102H

c)   AWA  10M

Three separate channels are provided for this service to enable aircraft operating throughout the forest regions to report smoke and fire reports to District headquarters and L.F.O. caravans.

4.5   V.H.F. Marine

a)   AWA Pilot Phone.

These radios are used in marine craft at Perth and Karratha and are for communications to Port or Harbour Authorities.

4.6   H.F. Network - Base Stations

There are two versions of high frequency single side band transceivers operating as base stations.

a)   Codan 6801

b)   Perth Communications 105

All transceivers are channeled as per region or specialist requirement.

### 4.7  H.F. Network - Mobiles

There are many different forms of HF-SSB transceivers in operation throughout the state and are as follows:

a)   Side ranger 120 and L/R;
b)   Kimberley 105;
c)   Codan, 6924, (Portable) 7515, 7727, 7727 TB Mobiles and 8121 Marine unit;
d)   Traeger safari.

All HF transceivers carry the CALM frequency allocation plus the relevant RFDS channels.  All transceivers except 7515 are rated at 100 WATTS PEP RF power output.  (PEP = Peak envelope power).

ANTENNA

INCOMING RADIO SIGNALS

OUTGOING RADIO SIGNALS

**RECEIVER**

Changes electrical signals at radio frequency to voice frequency

**TRANSMITTER**

Changes electrical signals at voice frequency to radio frequency

SPEAKER

MICROPHONE

SOUND

SOUND
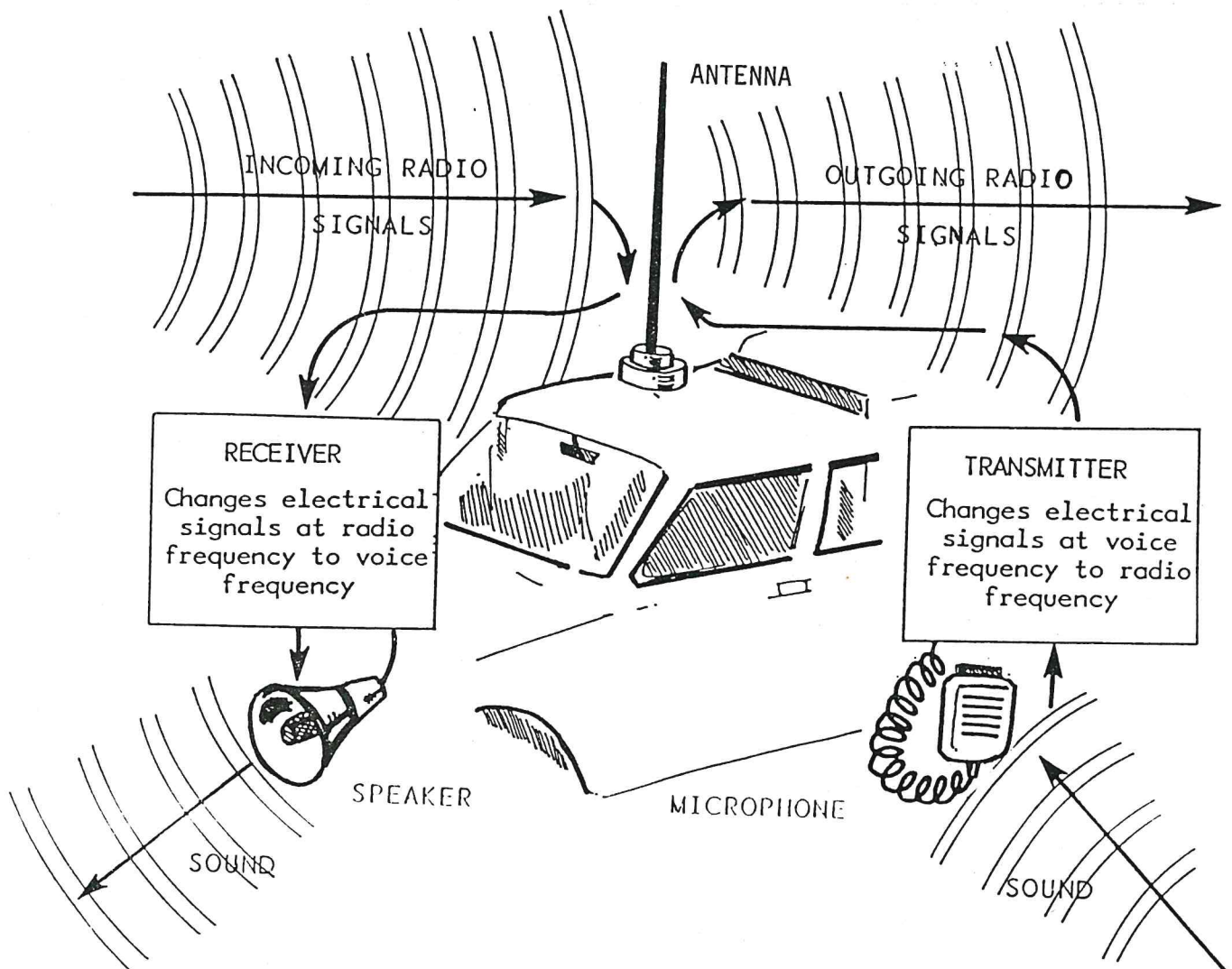
## 5.  MOBILE RADIO OPERATION

Radios operate by converting voice frequencies to radio frequencies when transmitting and vis versa when receiving (See Figure 5).

Figure 5:

Note:  It is important to remember that the transmitting and receiving sections of the unit are interconnected so that they cannot both operate at the same time.  This is done by means of a change-over switch on the microphone.

5.1  Microphone

The microphone is a sensitive piece of equipment which converts sound waves into an electrical signal.  It is important to observe a few simple rules for clear undistorted transmission:

(a)  Speak across the microphone and not directly into it. Speaking directly into the microphone may cause distortion.

(b)  Keep the microphone a constant distance from you so that it gives a consistent signal.

The best way to ensure correct usage of the microphone (See Figure 6) is to touch your cheek with you thumb and lightly hold this position so that if your head moves you will still maintain the critical relationship between your lips and microphone.



Figure 6:  Correct use of Radio Microphone

## 5.2 Controls

ON/OFF SWITCH. The use of this switch is self-explanatory, it simply controls the electrical power to the transceiver. Do not leave transceivers switched on when not in use as they will still consume power and may eventually drain the battery.

VOLUME CONTROL. The volume control controls the output volume of the receiver. Transmitter output is fixed and is not adjustable by the operator.

MUTE, SQUELCH OR NOISE CONTROL. Different names for the same control. Limits the sensitivity of the receiver to input noise.

To adjust, turn mute fully "OFF" - generally full rotation of knob anti-clockwise - a strong background noise should be audible.

Turn mute fully "ON" - generally full clockwise rotation - no background noise - receiver quiet.

Rotate "MUTE" control towards full "OFF" position until background noise heard. Reverse fractionally until the noise ceases. It may be necessary to re-adjust the mute control from time to time. Do not use "Mute" control as a "Volume" control.

CHANNEL SELECTOR. There are several versions of Channel Selector currently in use, e.g., rotary locking, rotary electronic, push-button. Channel of operation is set by the District or Region.

## 5.3 Antennas

Each Antenna is matched with its transceiver and failure to use the Antenna as directed by the manufacturers will result in poor communication.

A few simple rules:

(a)  Always ensure that the Antenna is fully extended;

(b)  Make sure that it is vertical, particularly in the case of hand-held units as there is a tendency to lay the unit over. Keep it upright (See Figure 7);

(c)  Avoid large metallic objects and parking under trees as these tend to weaken or distort the signal, (See Figure 7);

(d)  Do not transmit if the Antenna is broken or disconnected.

(e)  Check the "Tap" frequency setting is correct when using high frequency - SSB radio. (See Figure 9);

(f)  Do not allow people to stand within one metre of a whip type antenna when the transmitter is being operated.

# Figure 7:  Positioning of Antennas



**ANTENNA VERTICAL**
AND FULLY EXTENDED

**ANTENNA**
VERTICAL

WATER
TANK
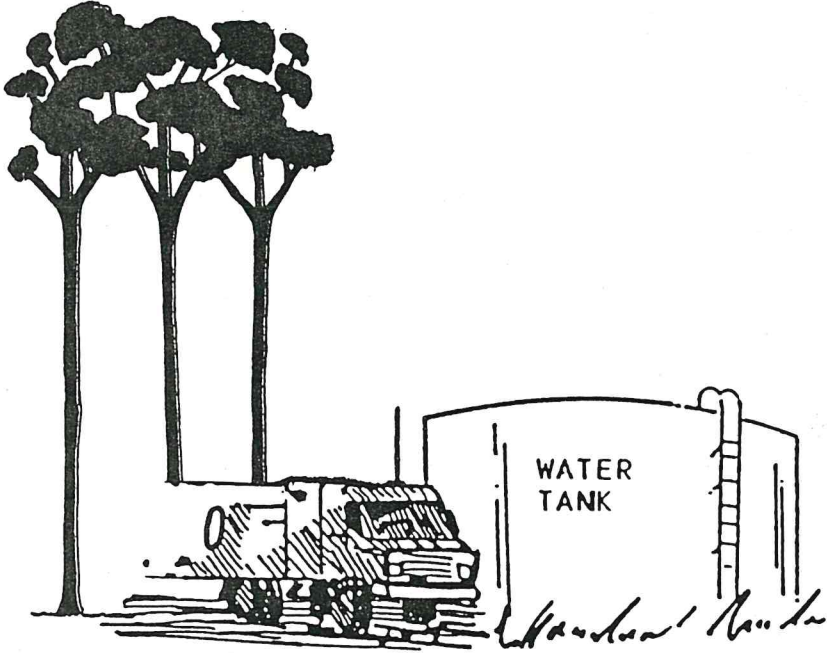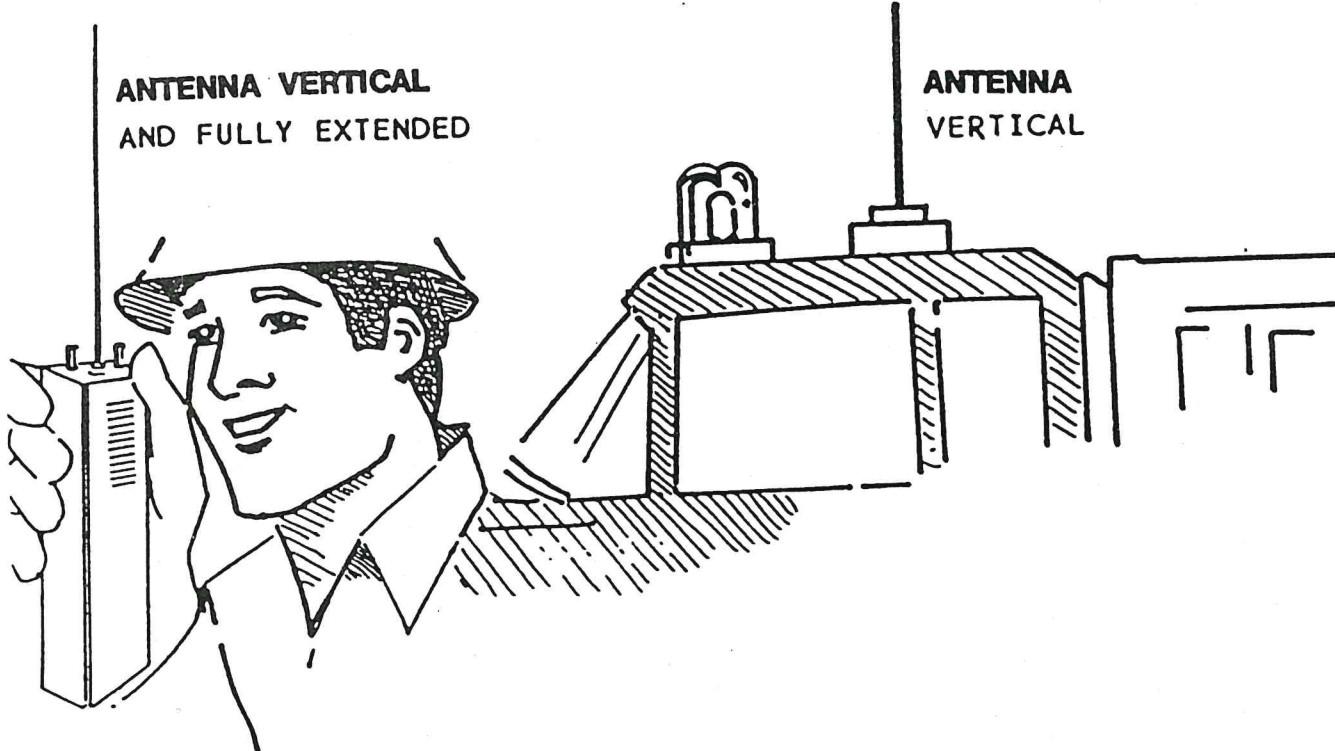
AVOID SUCH LOCATIONS

## 5.4 Types of Antennas - VHF
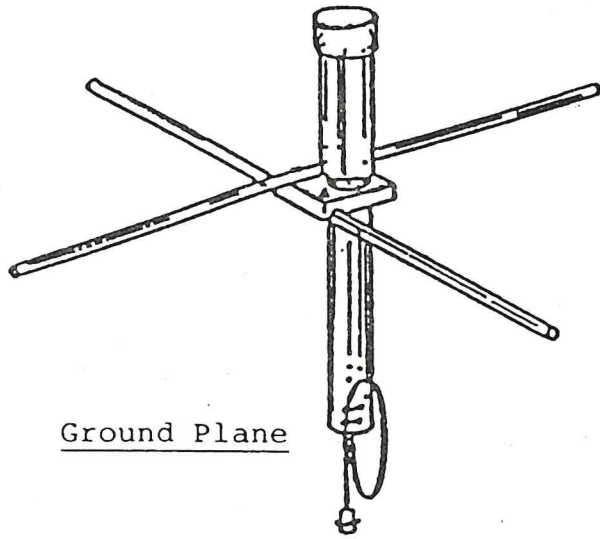


Ground Plane
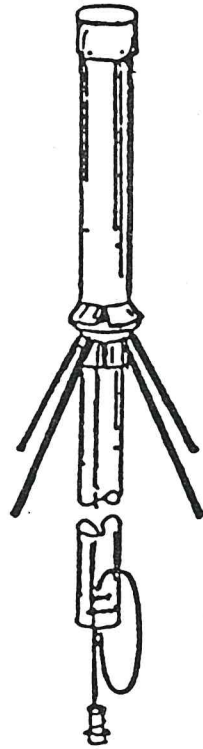
Ground Plane
(Monocone)
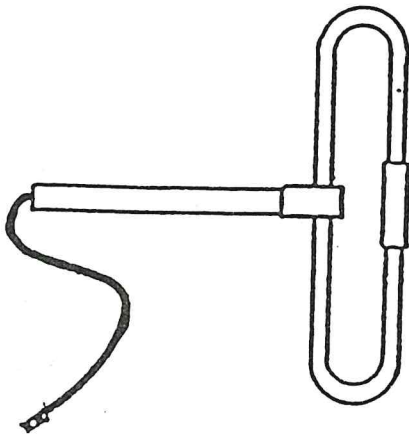
Side Mount Dipole
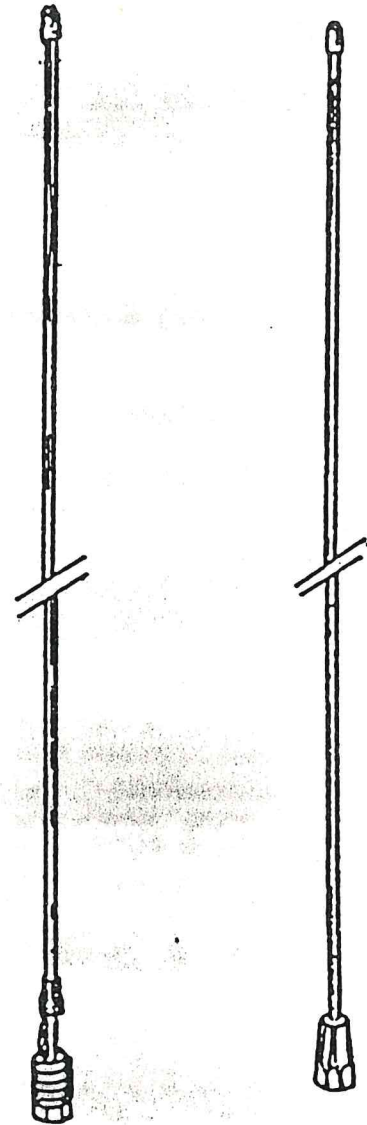
Quarter Wave Whips
(Mobiles)

VERY HIGH FREQUENCY ANTENNAS - BASE, REPEATER AND MOBILE

**Figure 8:**

Frequency "Tap" Points
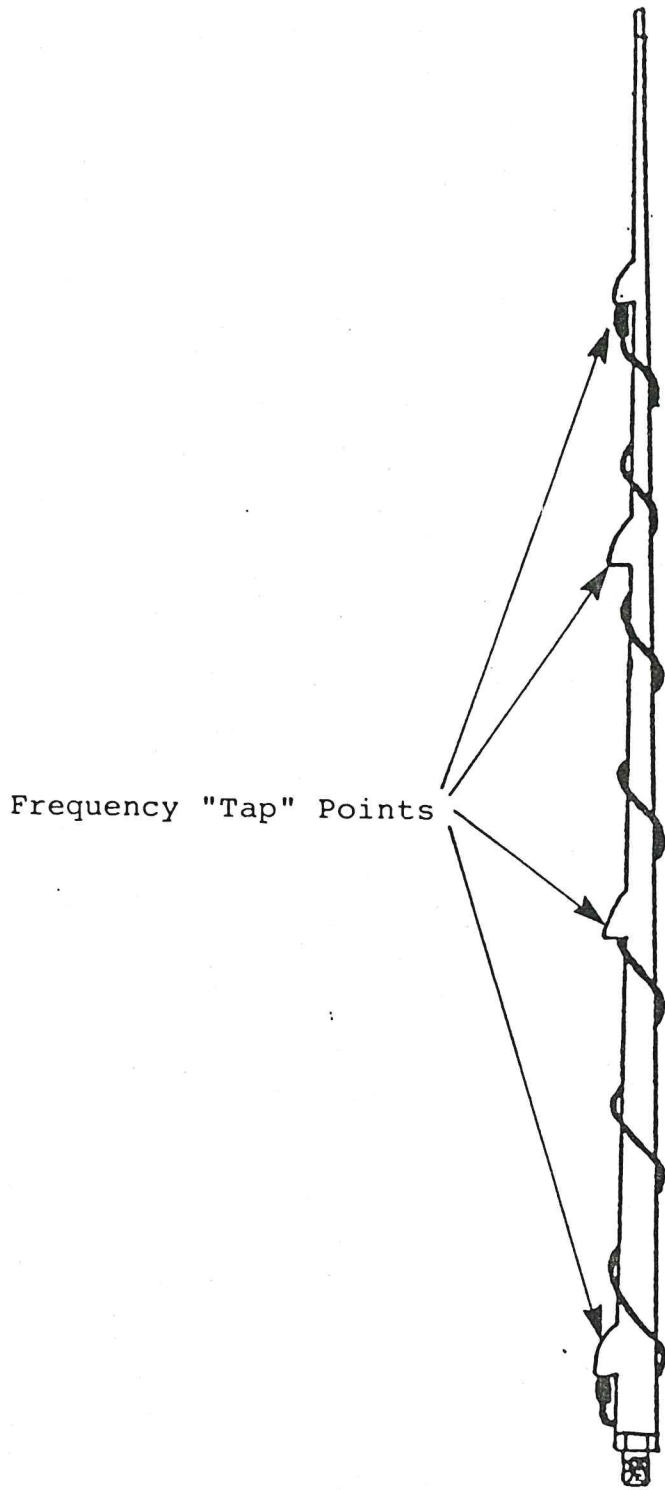
Figure 9:  A Typical HF Mobile Whip with 4 Frequencies

# 6. BASIC FAULT FINDING

| SYMPTOM | POSSIBLE CAUSE | ACTION |
|---|---|---|
| Radio totally inoperative | 1) Blown fuse (external) | Check and replace |
| "        "         " | 2) Battery U/S | Replace battery |
| "        "         " | 3) Blown fuse (internal) | Have repaired by Radio Technician. |
| Radio receives weakly or does not transmit | 1) Poor location | Move to different site |
| | 2) Coaxial cable U/S | Replace cable |
| | 3) Internal break in antenna | Replace antenna |
| | 4) Wrong antenna frequency | Change tap to correct frequency |
| | 5) Microphone U/S | Replace microphone |
| | 6) Radio switched to AM | Switch to SSB |
| | 7) Mute setting too coarse | Adjust or switch Off Mute |
| | 8) Atmospheric noise, thunderstorms | Persevere |
| | 9) Power lines nearby | Keep well away. |

## SECTION TWO

## RADIO PROCEDURE

7. RADIO NET DISCIPLINE

   Good discipline is essential to the efficient working of a radio net. Irrespective of rank within the organisation the Base Station Operator is in charge of the net, and is responsible for its radio discipline.

   The Regulations state that: "The Licensee is responsible for the operation of the service and to ensure that its control is in the hands of competent operators".

   Only trained or supervised staff under instruction will be permitted to operate a Base Station, therefore each Region/ District office must nominate one or more Base Station Operators, prior to each fire season.

8. RULES FOR RADIO NET DISCIPLINE

   To prevent confusion on a radio net, the following rules must be observed:

   > To utilize circuit time more efficiently, where practicable all messages, or their substance, should be written down prior to transmission, particularly when a person wishes to ensure that some vital information is passed accurately and that a record of that information is kept. Those messages which are to be delivered by the receiving operator to another person should be written down, and those preceded by the pro-word "MESSAGE" MUST be written down.

   > Transmissions must be as short and concise as possible, consistent with clarity. The use of standard phraseology results in brevity.

   > Transmissions should be clear with natural emphasis on each word, except for prescribed pronunciation of figures, and should be spoken in natural, sensible phrases, not word by word.

   > Information transmitted must be accurate and relevant.

   > All calls must be answered immediately and in correct answering order.

   > To avoid interfering with other traffic, an operator must ensure that a circuit is clear before starting a transmission.

ALWAYS PAUSE FOR THREE SECONDS BEFORE TRANSMITTING!  This simple rule should become automatic with all radio operators and it applies EVERY TIME an operator intends to transmit — even when contact has been established and traffic is in progress.  "LISTEN OUT" FOR THREE SECONDS BEFORE REPLYING — this will permit some other station whose traffic is more urgent than yours to break in — it could save a life!  If all operators observe this cardinal rule of listening out for three seconds before transmitting, everyone will know that every time they hear a station give an ending sign (OVER, OUT, etc) they have three seconds in which to break in in case of an emergency.  You will find also that traffic will flow much more smoothly and there will be less exasperation among the operators.

9.  STANDARD PROCEDURE

In the exchange of messages, it is essential that a standard procedure be followed.  Use of standard procedure will aid:

    a.    Brevity

    b.    Accuracy

    c.    Speed

    d.    Simplicity

9.1  How to Speak

Clear speech is necessary to help the receiving operator to understand you.  The following factors are important:

    a.    Rhythm

    b.    Speed

    c.    Volume

    d.    Pitch

9.2  Rhythm

Ordinary conversation has a natural rhythm.  This rhythm is to be preserved when speaking on the radio.  The message is spoken in short complete phrases that make sense, not word by word.

9.3  Speed

Send at writing speed, keep an even speed and do not rush or slur words.  Pause between phrases to give time to the receiver to write down the message.

9.4  Volume

Maintain normal speech volume.

9.5 <u>Pitch</u>

Use normal or slightly higher voice pitch.

9.6 <u>Phonetic Alphabet</u>

When it is necessary to identify any letter of the alphabet, the standard phonetic alphabet is to be used. (Refer paragraph 21, page 26).

9.7 <u>Pronunciation of Figures</u>

When figures are transmitted by radio, the rules for their pronunciation, are given below:

**PRONUNCIATION OF FIGURES**

| Figure | Spoken As |
|--------|-----------|
| 0 | Zero |
| 1 | Wun |
| 2 | Too |
| 3 | Thuh ree |
| 4 | Fo wer |
| 5 | Fi yiv |
| 6 | Six |
| 7 | Se ven |
| 8 | Ate |
| 9 | Niner |

The decimal point is to be spoken as DAY-SEE-MAL.

10. <u>RADIO NETS AND CALLS</u>

10.1 <u>Definitions</u>

10.1.1 <u>Pro-word</u>

Pro-words are pronounceable words or phrases which have been assigned meanings for the purpose of expediting message transmissions. A pro-word, or a combination of pro-words, are not used as the text of a message.

10.1.2 <u>Radio Net</u>

A number of stations operating on the same frequency for the purpose of communicating with each other.

### 10.1.3  Base Station

A station designated as responsible for the efficient clearance of traffic and maintenance of circuit discipline on a net.  The Base Station is normally located in the Region/District Office.

### 10.1.4  Network Callsign

A group of letters and figures used to identify a radio net.  The Network callsign for CALM is VL6DE or abbreviated (e.g., 6DE).

## 10.2  Calling and Answering

```
_____

            THIS   IS

            OVER

            OUT

            WAIT

            WAIT OUT

            ROGER

_____
```

### 10.2.1  Parts of a Call

A call consists of the following parts:

a.  CALLSIGN. Identifies the station(s) being called.

b.  THIS IS. A pro-word used to indicate that the callsign of the calling stations follows.

c.  CALLSIGN. Identifies the calling station (your own callsign).

d.  TEXT. The message itself.

e.  ENDING SIGN. A pro-word used to denote the end of the transmission.  These are:

   (1)  OVER. "This is the end of my transmission and a response from you is required.  Go ahead and transmit."

   (2)  OUT.  "This is the end of my transmission and no answer is required or expected. Any station is now free to transmit."

10.2.1   Parts of a Call (continued)

NOTE:   "CALLSIGN".   All callsigns should consist of the following:

a.      Net Callsign, allocated by D.O.C., e.g., "VL6DE".  This identifies your radio net from any other net which may on the air, and

b.      Station Callsign, allocated to each radio operating on the net, e.g., Protection "2".

c.      The complete callsign for, say, Protection "2" on the above net would be "VL6DE Protection "2".

10.2.2   Parts of an Answer

An answering transmission consists of the following parts:

a.      CALLSIGN. Identifies the station being called.

b.      THIS IS. The pro-word indicating that the callsign of the calling station follows.

c.      CALLSIGN. Identifies the calling station.

d.      TEXT. The answer.

e.      ENDING SIGN. Pro-words used to denote that the transmission has ended or that there will be a delay in providing the answer. These are:

    (1)     OVER. "This is the end of my transmission and a response from you is required. Go ahead and transmit."

    (2)     OUT. "This is the end of my transmission and no answer is required or expected.  Any station is now free to transmit."

    (3)     OUT TO YOU. Used only by the Base Station unless direct communications between sub- stations has been authorised.

    (4)     WAIT. "I must pause for a maximum of five seconds.  No other station is to transmit during this pause." (The operator must, of course release his "press to talk" button to leave he net clear for an emergency call).

10.2.2  Parts of an Answer (continued)

(5)  WAIT OUT. "I must pause (You must wait) for more than five seconds. Any station is free to transmit in the meantime." (When he has obtained the answer, the operator would initiate a normal call to the station requiring the information).

## 10.3  Types of Calls

There are three types of calls:

### 10.3.1  Single Call

A call between any two stations on the net.

### 10.3.2  Multiple Call

Used when one station wishes to call two or more other stations on the net, but not all stations. Stations are called in numerical order, and answer in the same order.

### 10.3.3  Net Call

Used to call all stations on the net, stations reply in numerical order.  If a station fails to answer in its turn, the NEXT IN TURN answers after a pause of five seconds.  The defaulting station should then answer last (if able to do so).

## 10.4  Scheduled Net Calls (Mainly HF Nets)

Some radio nets conduct scheduled administrative/ information sessions at predetermined intervals and times. A suggested method of establishing communications is:

On the designated day and at the designated time all stations "switch on" and Control transmits:

**"ALL STATIONS — THIS IS VL6DE BASE — OVER."**

Each sub-station then answers the call in correct sequence, indicating if they have anything to communicate by use of the pro-word "TRAFFIC".  In this example Mobile 2 and Mobile 3 have traffic.  Control should, of course, have a method of recording each sub-station as it answers, and whether or not it has traffic.

10.4    Scheduled Net Calls (Mainly HF Nets) (continued)

"(VL6DE Base) -(THIS IS) VL6DE1 - OVER"

"VL6DE1 - (THIS IS) (VL6DE Base) - OUT."

"(VL6DE Base) - (THIS IS) VL6DE2 - TRAFFIC - OVER."

"VL6DE2 (THIS IS) (VL6DE Base) - ROGER - OUT."

"(VL6DE Base) - (THIS IS) VL6DE3 - TRAFFIC - OVER."

"VL6DE3 - (THIS IS) (VL6DE Base) - ROGER - OUT TO YOU."

Control then calls the net to inform them that their transmissions have been heard satisfactorily and that he is now ready to proceed with net business:

"ALL STATIONS - (THIS IS) (VL6DE Base) - OUT TO YOU."
(pause for thee seconds "Listening out") then calls the first of the stations which as traffic:

"VL6DE2 - (THIS IS) (VL6DE Base) - SEND YOUR MESSAGE - OVER."

The net then operates until all business is completed, and it closes down.


11.    ABBREVIATED PROCEDURE

Under normal working conditions abbreviated procedure is used to save time.

Procedures are abbreviated by omitting the callsign(s) of called station(s), other than in the initial call, and any non-essential prowords.  In a single call, all callsigns may be omitted after the initial call and reply.

Example:  Single call:

6DE Manjimup THIS IS Manjimup 5, I will be away from the radio for 20 minutes OVER.

6DE Manjimup OK OUT.

NOTE: When ending all transmissions under abbreviated procedure, station callsigns should be used when signing off.


12.    RADIO CHECKS, SIGNAL STRENGTHS AND READABILITY

A station is understood to have good signal strength and readability unless otherwise notified.  Strength of signals and readability are not to be exchanged unless one station cannot clearly hear another station.

12. RADIO CHECKS, SIGNAL STRENGTHS AND READABILITY (continued)

A station who wishes to inform another of his signal strength and readability is to do so by means of a short and concise report of actual reception such as "weak but readable", "loud but distorted", "weak with interference", etc.

The following pro-words are for use when initiating and answering queries concerning signal strength and readability:

(a) General

   (1) Radio Check. What is my signal strength and readability, that is, how do you hear me?

   (2) Roger. I have received your last transmission satisfactorily. (The ommission of comment on signal strength and readability is understood to mean that reception is satisfactory. If reception is other than satisfactory it must be described with the prowords listed at Paragraphs 12b, and 12c).

   (3) Nothing Heard. To be used when no reply is received from a called station.

(b) Report of Signals Strengths

   (1) LOUD. Your signal is very strong.

   (2) GOOD. Your signal strength is good.

   (3) WEAK. Your signal strength is weak.

   (4) VERY WEAK. Your signal strength is very weak.

   (5) FADING. At times your signal strength fades to such an extent that continuous reception cannot be relied upon.

(c) Report of Readability

   (1) CLEAR. Excellent quality.

   (2) READABLE. Quality is satisfactory, an odd word is being missed.

   (3) DISTORTED. Having trouble reading you because your signal is distorted, perhaps half the words are being missed.

   (4) INTERFERENCE. Having trouble reading you due to interference, only odd words are being understood.

   (5) UNREADABLE. The quality of your transmission is so bad that I cannot read you.

## 13. SPELLING AND GRID REFERENCES

### 13.1 Spelling

Difficult words or groups within the text of plain language messages may be spelt using the phonetic alphabet, and preceded by the pro-word I SPELL. If the operator can pronounce the word to be spelt, he will do so before and after the spelling to identify the word.

Example A: A pronounceable word:

BREWERY ..... I SPELL — BRAVO ROMEO ECHO WHISKEY ECHO ROMEO YANKEE ..... BREWERY.

Example B: An unpronounceable abbreviation:

Call at WAWA depot for WATER is transmitted as:

Call at I SPELL — WHISKEY ALPHA WHISKEY ALPHA — depot for WATER.

### 13.2 Grid References

All grid references are sent digit by digit and all letters are pronounced phonetically. Grid references are preceded by the proword GRID.

Example: GRID REFERENCE CV 66 45 would be sent

"GRID CHARLIE VICTOR 66 45"

## 14. WRITTEN MESSAGE PROCEDURE

The following procedure is to be used whenever the sender requires a message to be written. The proword "MESSAGE" should precede the transmission.

The message is to be sent in sections, each lasting approximately half a minute, and each except for the last section terminating with the proword, "ROGER SO FAR".

Receiving stations are to acknowledge each section, and if necessary, as for repetitions.

After obtaining receipts for each section from all, or selected receiving stations, remember the sender should pause for three seconds. This will allow other stations to transmit urgent traffic.

## 14.1 Correction During Transmission

When an error is made by a transmitting operator, the pro-word CORRECTION is to be transmitted followed by the last word, group, pro-word or phrase correctly transmitted; transmission then continues. Care should be taken to avoid using words or pro-words which appear more than once in the message.

> Example: Example of a correction during transmission is as follows:
>
> 6DE PROTECTION 2 THIS IS PROTECTION 1 MOVE TO GRID HOTEL WHISKEY FOUR FIVE NINE TWO
>
> CORRECTION GRID HOTEL WHISKEY FOUR FIVE EIGHT THREE OVER
>
> PROTECTION 1 THIS IS PROTECTION 2 ROGER OUT.

## 14.2 Repetitions

When words are missed, or are in doubt, NEVER try and guess what they are. Repetitions should be requested before signing off. The pro-word "SAY AGAIN" used alone for short messages or in conjunction with "ALL BEFORE", or "ALL AFTER", should be used.

> Example:
>
> DWELLINGUP BASE TRANSMITS TO DWELLINGUP 5:
>
> DWELLINGUP 5 - THIS IS VL6DE DWELLINGUP - Change your location to GRID LIMA KILO FOUR THREE ONE SIX - and advise me you arrive there - OVER.
>
> Dwellingup 5 replies:
>
> VL6DE DWELLINGUP - THIS IS DWELLINGUP 5 - SAY AGAIN - ALL BEFORE and advise me - OVER.
>
> DWELLINGUP BASE would send:
>
> I SAY AGAIN - ALL BEFORE and advise me - Change your location to GRID LIMA KILO FOUR THREE ONE SIX - OVER.
>
> Dwellingup 5 replies:
>
> ROGER - DWELLINGUP 5 - OUT.

## 15. CHANGING FREQUENCY

On VHF radio circuits, frequencies are referred to by an appropriate channel number, such as channel one, channel two, etc.

On HF circuits, frequencies are referred to in kilohertz and spoken digit by digit. Thus, 3732 KHz would be spoken as: Three Seven Three Two Kilohertz.

15.  CHANGING FREQUENCY (continued)

> Example:  Example of a frequency change is as follows:
>
> The control stations transmits:
>
> ALL MOBILES THIS IS 6DE MANJIMUP CHANGE TO Channel Two OVER
>
> Each MOBILE answers in turn:
>
> > MANJIMUP  1  ROGER  OVER
> >
> > MANJIMUP  2  ROGER  OVER
> >
> > MANJIMUP  3  ROGER  OVER
>
> The control stations transmits:
>
> All stations THIS IS 6DE MANJIMUP CHANGE NOW OUT.

The base and all mobiles then immediately change to the new frequency/channel.  The base then establishes communications with all mobiles.

16.  TIME

The 24 hour clock should be used whenever transmitting the time. Its use dispenses with the need for A.M. and P.M. and avoids confusion.

a.    It must always consist of four figures.

b.    The first two figures represent the whole hours after midnight.

c.    The second two figures represent the minutes.

d.    The whole group must be followed by the word "hours" (abbreviated "hrs").

e.    After 12 noon the hours are counted on up to 23 - viz. 1 p.m. is 1300; 2 p.m. is 1400 and so on.

Some examples are:

12.8 a.m. is 0008 hours
12.8 p.m. is 1208 hours
10.00 a.m. is 1000 hours
10.00 p.m. is 2200 hours
12 noon is 1200 hours
1.15 a.m. is 0115 hours
1.15 p.m. is 1315 hours
1 minute before midnight is 2359 hours.

17.  DELEGATING CONTROL

It may be necessary for control to be delegated to a sub-station when effective control cannot be maintained by the Base or when the Base has to leave the net for any reason.  e.g., Albany base may delegate control of the net to Esperance.

## 18. RELAY PROCEDURE

If communications between any two stations fail, messages may be sent through a third station that is in contact with both.

## 19. WORDS TWICE

When communications are difficult, callsigns and offers should be transmitted twice with the use of the prowords WORDS TWICE.

Example:

Karratha Base transmits, having decided that conditions warrant the use of "WORDS TWICE" procedure.

KARRATHA 2 - KARRATHA 2 - THIS IS VL6DE KARRATHA - THIS IS VL6DE KARRATHA - OVER - OVER

Protection 2 would reply.

VL6DE KARRATHA - VL6DE KARRATHA - THIS IS KARRATHA 2 - THIS IS KARRATHA 2 - OVER - OVER and so on.

## 20. READ BACK procedure is used when a sender wishes to ensure that his message has been received correctly. In this case the proword "READ BACK" should be used.

## 21. PHONETIC ALPHABET

| Letter | Phonetic | Spoken As |
|--------|----------|-----------|
| A | Alpha | Al fah |
| B | Bravo | Brah voh |
| C | Charlie | Char lee |
| D | Delta | Del ta |
| E | Echo | Eck oh |
| F | Foxtrot | Foks trot |
| G | Golf | Golf |
| H | Hotel | Hoh tell |
| I | India | In dee ah |
| J | Juliett | Jew lee ett |
| K | Kilo | Key loh |
| L | Lima | Lee mah |
| M | Mike | Mike |
| N | November | No vem ber |
| O | Oscar | Oss cah |
| P | Papap | Pah pah |
| Q | Quebec | Key beck |
| R | Romeo | Ro me oh |
| S | Sierra | See air rah |
| T | Tango | Tan go |
| U | Uniform | You nee form |
| V | Victor | Vik tah |
| W | Whiskey | Wiss key |
| X | X-Ray | Ecks ray |
| Y | Yankee | Yang key |
| Z | Zulu | Zoo loo |

## 22. PRO-WORDS

| Pro-word | Meaning |
| --- | --- |
| ALL AFTER | The portion of the message to which I refer is all that which follows..... |
| ALL BEFORE | The portion of the message to which I refer is all that which precedes..... |
| ALL STATIONS | This is a Net Call to all stations operating on this radio net. |
| ASSUME CONTROL | You are to assume control of this net until further notice. |
| CALLSIGN | That which follows is a callsign. |
| CHANGE NOW | Change frequency now. |
| CHANGE TO | When instructed to do so, change frequency to ..... |
| CLEAR | Your signal is of excellent quality. Every word is being understood. |
| CORRECTION | An error has been made. The correct version is ..... |
| DISTORTED | Your signal is distorted. Perhaps half the words are being missed. |
| FADING | At times your signal fades to such an extent that continuous reception cannot be relied upon. |
| GOOD | Your signal strength is good. |
| GRID | A Grid Reference follows. |
| GRID SQUARE | A Grid Square Reference follows. |
| I AM ASSUMING CONTROL | I am assuming control of this net until further notice. |
| INTERFERENCE | I am having trouble reading you due to interference. Only odd words are being understood. |
| I READ BACK | The following is in response to your instruction to read back. |

## 22. PRO-WORDS (continued)

| Pro-word | Meaning |
|---|---|
| I SAY AGAIN | I am repeating my transmission or the portion indicated. |
| I SPELL | I shall spell the next word(s) phonetically. |
| LOUD | Your signal is very strong. |
| MESSAGE | A message which requires to be written down follows. |
| NOTHING HEARD | I have not received a reply, or heard, from the station(s) whose callsign(s) I have just given. |
| OVER | This is the end of my transmission to you and a response is necessary. Go ahead and transmit. |
| OUT | This is the end of my transmission to you. No answer is required or expected. Any station is now free to transmit. |
| OUT TO YOU | This is the end of my transmission to you and no answer is required or expected. I am about to call another station immediately and except in an emergency no other station is to transmit in the meantime. (Note: The operator must then pause for three seconds before calling the next station). |
| RADIO CHECK | What is my signal strength and readability? That is, how do you hear me. |
| READABLE | The quality of your signal is satisfactory. An odd word is being missed. |
| READ BACK | Repeat this entire message (or the portion indicated) back to me exactly as you have received it. |
| ROGER | 1. I have received you last transmission satisfactorily, or 2. In response to your request for a RADIO CHECK I am receiving you "LOUD and CLEAR". |

## 22. PRO-WORDS (continued)

| Pro-word | Meaning |
| --- | --- |
| ROGER SO FAR | 1. Have you received my transmission satisfactorily up to this point?; or<br><br>2. I have received your transmission satisfactorily up to your query "ROGER SO FAR". |
| SAY AGAIN | Please repeat all of your last transmission (or the portion indicated). |
| THIS IS | This transmission is from the station whose callsign follows. |
| TRAFFIC | I have traffic for you and will transmit it when you advise me to do so. (Note: Used only on Schedule Net Calls). |
| UNKNOWN STATION | I do not know the identity of the station which I just heard transmitting. |
| UNREADABLE | The quality of your signal is so bad that practically nothing is being understood. |
| VERY WEAK | Your signal strength is very weak. |
| WAIT | I must pause for up to a maximum of five seconds. Except in an emergency no other station is to transmit during this pause. |
| WAIT-OUT | I must pause (you must wait) for more than five seconds. Any station is free to transmit unless otherwise indicated in this transmission. |
| WEAK | Your signal strength is weak. |
| WORD AFTER | The word in the message to which I refer is that which follows ..... |
| WORD BEFORE | The word in the message to which I refer is that which precedes ..... |
| WORDS TWICE | Communication is difficult. Please transmit each phrase twice. |

23. DO'S AND DON'TS

## DO'S

1. Always speak distinctly at a regular medium speed.

2. Do practise and become thoroughly proficient in the use of the Phonetic Alphabet and the 24 hour clock method of telling the time.

3. Do make use of authorised PRO-WORDS.

4. Always obey the orders of the Net Control Station.

5. Always think about what you are going to say BEFORE you start, and then keep it short and concise.

6. ALWAYS OBSERVE THE THREE SECONDS PAUSE BEFORE TRANSMITTING.

7. Offer to relay messages if you become aware that stations you can hear are having trouble communicating with each other.

8. Make a practice of testing your radio regularly all year round.

## DON'TS

1. Don't shout, or drop your voice towards the end of sentences.

2. Don't develop personal quirks such as "OVER AND OUT", "DO YOU READ", etc.

3. Never close down or leave your radio even for a short time, without first notifying control.

4. Don't use profane or obscene language.

5. Don't offer unnecessary traffic, particularly in times of emergency.

## SECTION  THREE

## OTHER  COMMUNICATIONS  SYSTEMS

24.  LIMITATIONS OF EXISTING SYSTEMS

Expansion of the existing "Two Way Radio" communications system
to meet individual requirements in the future is severely
restricted due to the limited number of frequencies which can be
made available.

The alternative therefore, is to either use the existing airspace
allocated more efficiently, or adapt some other form of
communication.

25.  MOBILE RADIO DATA SYSTEM

A Western Australian firm, "Radtek Corp" has developed a system
which enables digital data to be sent via CALM's existing two way
radio network, without any interference to voice communication.

Base Station:  The base station consists of a computer (e.g.,
mini or personnel computer) comprising of screen, keyboard and
printer, interfaced with a two way radio.

Messages are keyed into the computer which, on detecting a break
in voice traffic sends the message (120 characters per second) to
a designated other station, e.g., mobile unit or F.C.P.

Mobile Unit:  There is a choice of two units which can be
installed into vehicles depending on the degree of flexibility
required.  The more basic unit, "Autoprint", enables messages to
be received in printed form only.  The unit can be programmed
with STATUS information (messages) which can be sent to the base
by entering the correct code into the units decimal keyboard
(0-9).

The other option is to install an "Autolink" unit, which
incorporates a full typewriter keyboard with a four line (160
character) liquid crystal display screen.

Message can be keyed into the unit and sent either to the base or
another mobile and is compatible with both H.F. and V.H.F. modes.
Messages can either be connected to the unit, following messages
to be received in printed format.

24.1  Features of the System

Messages can be stored in the base station computer which
will automatically send them to their designated
destinations whenever a break in transmission occurs, and
indicate to the operator that each message was sent and
that is was also received.

Messages can be received and either be stored in the "Autolink" memory or printed out, whether the unit is manned or not.

All data transmissions are confidential, it is also possible to send to selective receiving stations.

Being the printed word, time is saved in misinterpretations and repeating of messages.

A copy of all messages pass through the base are recorded on "floppy disc" for recall any time. Being in written word operators are forced to give more thought in form-ulating messages, generally resulting in more accurate, concise information.

The system can allow a mobile field unit to have access to a central mainframe computer, obtaining data from or putting data back into the computer, while in the field.

A basic system consisting of base station, F.C.P. and two mobile units, not taking into account the cost of a computer, base printer or radio network would be approximately $13,000.00.

## 26. ROYAL FLYING DOCTOR SERVICE

### 26.1 Medical Radio Consultation

Each Base has its own specified times for routine medical radio consultation. If during normal Base hours (including School of the Air time) medical advice is required and cannot wait until the next routine medical session, the following procedure should be adopted:

(a)  Wait until the first quiet moment on the frequency and then transmit "V...(Base Station call sign) this is portable XYZ with a medical".

(b)  On receipt of this call, the Base will deal only with the Station seeking medical advice.

(c)  Should the frequency in question be heavily congested with traffic and "quiet" periods are not forthcoming, the above medical call should be preceded by a 15 second R.F.D.S. emergency alarm tone.

### 26.2 Medical Assistant Required

If medical assistance is required at a period when the Base is normally closed, at night or on weekends, then the following procedure should be adopted:

(a)  Switch on the transceiver and select the required frequency.

## 26.2   Medical Assistant Required (continued)

(b)   Listen to see if the required Base is working.

(c)   If not, depress the "Emergency Call" button for a minimum of 15 seconds.

(d)   Within 2 minutes of pressing the alarm button, the Base will automatically respond with its netting tones which will be transmitted for a 15 second period.

(e)   Should this tone not be heard within 2 minutes of pressing the alarm button, transmit the alarm tones again – for a longer period of time.

(f)   If again unsuccessful, try changing to another frequency (each Base guards two frequencies).

Once the Base nett tones have been heard, rest assured that alarm bells are ringing in either the local hospital or at the police station and it is known that a station requires assistance.  Dependent upon which Base is being called, it will either be hospital, police or R.F.D.S. staff who will, up to 5 minutes after receiving the alarm call, be heard on air asking for the station with an emergency to "identify themselves".  The mobile should then respond in the manner set out for a medical call as explained in paragraph above.

## 26.3   Radio-telephone (Radphone) – Radio-telegram

Each Base operates a radio-telephone and radio-telegram service.  As a mobile radio user, simply establish contact with your nearest R.F.D.S. on one of their radio schedules and either book your phone call or transmit your telegram.  Dependent upon circuit congestion (the number of outposts using the Base) your Radphone call may be connected immediately, or you may have to wait a few minutes.

## 26.4   R.F.D.S. Bases and How to Contact Them

### By Telephone

FREE – Radphone Booking Line ONLY

| | | | |
|---|---|---|---|
| Wyndham | 091-611399 | – | (0800-1600 M-F) |
| Derby | 091-911612 | – | (0800-1530 M-F) |
| Port Hedland | 091-731200 | – | (0730-1700 M-F) |
| Carnarvon | 099-412100 | – | (0730-1700 M-F) (0800-0900 Sat/ P. Holidays) |
| Meekatharra | 099-811202 | – | (0730-1700 M-F) (0900-1000 Sat, Sun, P. Hols.) |
| Kalgoorlie | 090-216029 | – | (0830-1645 M-F) (0900-0945 Sat, Sun, P. Hols.) |

26.4  <u>R.F.D.S. Bases and How to Contact Them</u> (continued)

| By Radio | By Day | By Night |
|---|---|---|
| Wyndham/VKF | 5300/6945 | 5300/2805 |
| Derby/VJB | 5300/6945 | 5300/2795 |
| Port Hedland/VKL | 4030/6960 | 4030/2280 |
| Carnarvon/VJT | 4045/6890 | 4045/2280 |
| Meekatharra/VKJ | 4010/6880 | 4010/2280 |
| Kalgoorlie/VJQ — For Radphone Traffic Only | | |
| Base Transmit 7550 | 5360/6825 | 5360/2656 |
| Base Receive  8144 | | |

All Bases other than Kalgoorlie use their Day frequencies
for Radphone services.

27.  <u>TELECOM</u>

The Department has purchased a portable telephone which can be
used from a vehicle or put in the Field Control Point.

The facility operates on UHF and is therefore line of sight of
the three towers erected by Telecom.  There are two towers in the
metropolitan area and one near Bunbury.

Although its use is restricted to the outer metropolitan area and
within a radius of 30 to 50 km around Bunbury, the facility is
invaluable where it does work.

Likely Field Control Points within range of the Telecom towers
should be tested for the possibility of using the unit at a fire
situation.

SECTION FOUR

FIELD CONTROL POINT OPERATION


28.  UNDERLINE INTRODUCTION

The basis of safe, efficient and successful firefighting is good
organisation at the fire face.  For this to be a reality, the
organisation must have predetermined chain of command and
functional responsibilities and the establishment and mainten-
ance of a disciplined and effective communication network.

The establishment of a Field Control Point is fundamental to the
success of the large fire organisation.


29.  THE FIELD CONTROL POINT

This can be defined as the designated place located near the
fire area for the purpose of providing co-ordination,
communication and control of forces at the fire.

The degree of sophistication will depend on the requirement for
basic organisation, i.e., At a small fire attended by one or two
crews, a vehicle parked by the roadside and manned by one
officer may be sufficient.  During a very large fire attended by
large number of forces from CALM and from other organisations,
the field control point will consist of a number of control
centres for each of the participating organisations.  In complex
situations such as a Campaign Fire there will be a large number
of officers having different functions to perform (e.g., Fire
Boss, Field Supply, Intelligence, Liaison, Communications, Radio
Operators and Recorders etc.).

A chart showing an example layout of a Campaign Fire Control
Point is attached.


30.  FUNCTION OF THE FIELD CONTROL POINT

The Field Control Point provides the following services for the
firefighting organisations:-

.  A rendezvous for incoming forces and support personnel to be
   met and briefed as to their task, responsibilities,
   administration, and communication arrangements.

.  To provide a command post for the officer in charge from
   which he can issue directions.

.  To provide a communication network linking forces around the
   fire and the District Headquarters for all the organisations
   involved.

## FIELD CONTROL POINT LAYOUT

### (Campaign Fire Layout – dotted lines)

1.  This chart aims to highlight the minimum functional areas which must be planned for in any Field Control Point layout and will depend on each field situation.

2.  Minimum of 25m. should separate each component of a Field Control Point.

3.  Other organisations not to establish their Field Control Point in, or too near, a CALM Field Control Point, i.e., only OIC/Liaison Officers to enter roped off areas.

4.  All camping to be remote from Field Control Point.

5.  Communication, access, safety to be considered.

| OIC. Police<br>OIC. S.E.S.<br>OIC. ADF. etc | C.A.L.M.<br>Fire Boss<br>Suppression Boss | OIC.  B.F.B<br>&<br>Comms. Van |
|---|---|---|
| Field Liaison<br>Field Media | Radio Oper.<br>Recorder / C.P. van<br>or tent | Briefing<br>Area |

L.F.O. Van No. 1

| Field Supply<br>Officer and<br>Despatcher | Fire Resources<br>Record<br>System | Field<br>Plant | Field<br>Intelligence |
|---|---|---|---|

L.F.O. Van No. 2

→ Rope Barriers

| Fuel, Oil,<br>Water Storage<br>Area<br><br>MAINTENANCE AREA<br>20m. x 20m.<br><br>L.F.O. - 50 Vehicles<br>(200m. x 100m.)<br><br>C.F.O. - 250 vehicles<br><br>PARKING | ASSEMBLY AREA<br>(100m. x 100m)<br><br>L.F.O. -  50men<br>C.F.O. - 250men | C.P. Catering<br>&<br>Welfare<br><br>(50m. x 50m.)<br><br>NOTE: Crews to be<br>fed on fireline |
|---|---|---|

30. <u>FUNCTION OF THE FIELD CONTROL POINT</u> (continued)

. To provide a base for field intelligence and recording system to determine progress on fire spread, fire line construction and deployment of forces around the fire.

. A base to which stores and supplies can be sent before re-distribution around the fire.

31. <u>LOCATION OF FIELD CONTROL POINT</u>

The ideal location for the Field Control Point should be such that all incoming fire suppression forces have to pass it on the way to the fire. The site should not become threatened by the fire, and located where directions to find it can be easily understood so that is is easily recognizable to non-local forces. There must be adequate space for parking and assembly of vehicles and equipment.

Most importantly the site should be such that is provides trouble-free communications for V.H.F. and U.H.F. networks as well as the mobile telephone. For this reason it is advisable that good communication sites be recognized and recorded on District maps in advance of the fire season.

32. <u>COMMUNICATIONS</u>

The Field Control Point acts as the fire base for control of the radio networks of the CALM forces at the fire face. Where more than one network is present it has an additional co-ordination function. A diagram of a communications network involving CALM, Bush Fire Board, Brigades and other support organisations is attached.

33. <u>STAFF REQUIRED AT FIELD CONTROL POINT</u>

In the most basic circumstances, one officer may be sufficient to staff the Field Control Point. Where only one or two fire crews are involved. In very complex fires requiring large numbers of men and equipment, or involving several other suppression and support organisations, there is a need to staff the Field Control Point with the following:

<u>Fire Boss</u>                    &mdash;   Directs and supervises all work on the fire face. Directs CALM Field Control Point staff and CALM Sectors Bosses.

<u>Field Supply Officer</u>   &mdash;   (often referred to a Control Point Officer) - Organises receival, despatch and marshalling of stores, men, equipment, fuel, food etc.

# LARGE FIRE COMMUNICATIONS NETWORK
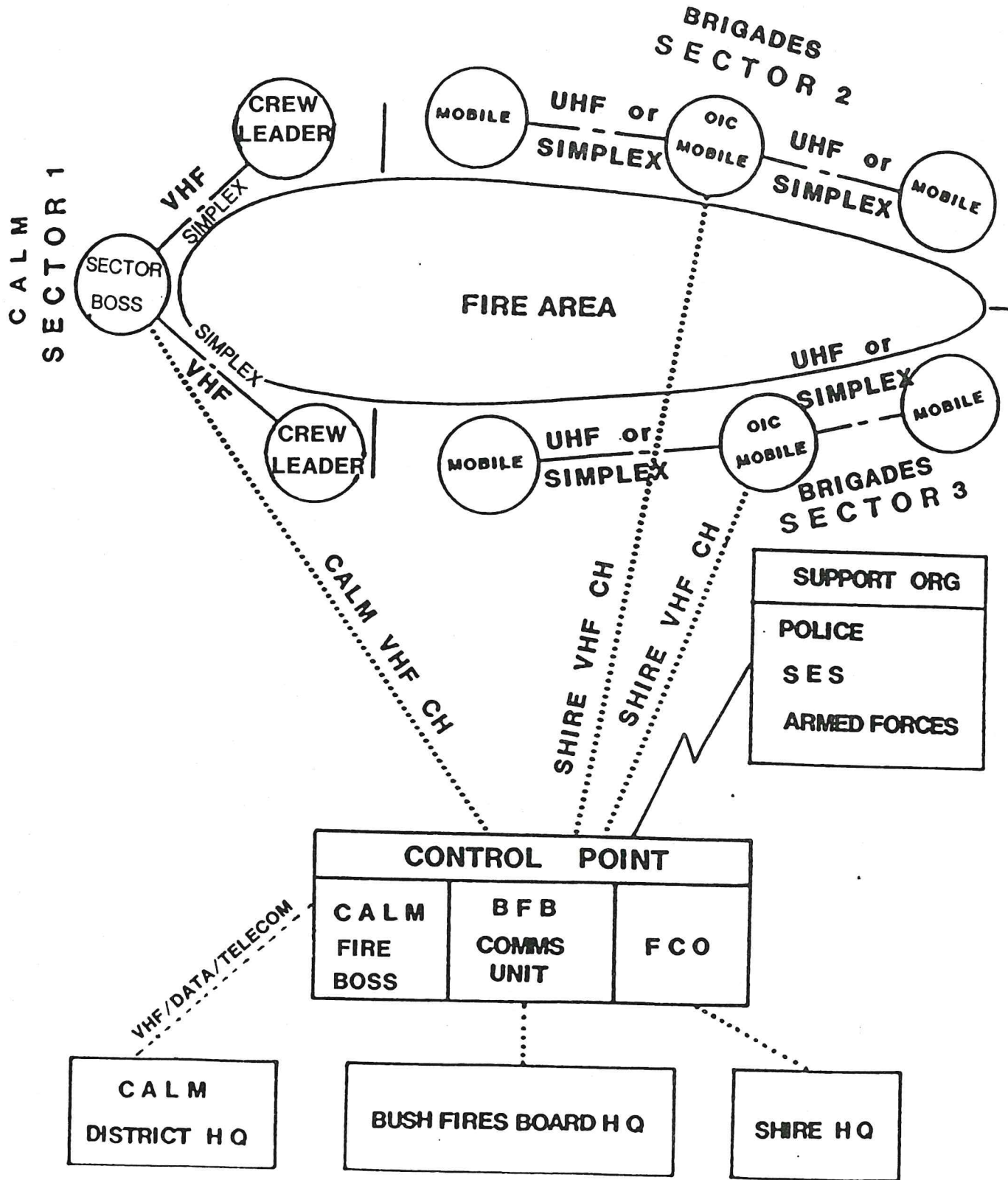


COMMUNICATIONS SYSTEM FOR FIRE

INVOLVING: BRIGADES, C A L M. SUPPORT ORGANSATIONS

| | |
|---|---|
| Field Supply Officer (continued) | – Manages Field Control Point and Field Despatch Centre. |
| | – Directs Communications Officer to ensure that communication systems and recording systems are operating effectively. |
| Communications Officer | – Directs Field Control Point Radio Operators, Recorders and Radio Technicians. |
| Radio Operators/ Recorder | – Receives, transmits and records all messages to and from key personnel at Field Control Point. |
| Control Point Marshall | – Directs and controls movement of men, and equipment near Control Point. |
| Field Despatcher | – Despatches forces to and from fire as directed. Records movement of fire forces on Fire Resources Recording System at Despatch Centre. |
| Liaison Officer | – Provides link between CALM (Fire Boss) and outside organisations (BFB, Police, St John, Army etc). |
| | – Co-ordinates activity of Media personnel at fire. |
| Intelligence Officer/ Reconnaissance | – Obtains field information on fire behaviour and fire line production and advises Fire Boss. |
| Environmental Advisor | – Provides advise on environmental constraints to fire suppression operations. |

34.  CHAIN OF COMMAND

The attached diagram shows the chain of command of the Field Control Point Organisation at a Large Fire or Campaign Fire Organisation.

```
                                        FIRE BOSS
                                            |
    ┌───────────────────────┬───────────────┴───────────────────────────────────┐
    |                       |               |                                     |
Field Intelligence     Field Liaison   Suppression                          Field Supply
                                           Boss
    |                   ┌───────┴───────┐  ┌──────┴──────┐     ┌───────────────────┼───────────────────┐
    |                   |               |  |      |      |     |                   |                   |
Environmental Officer  Field Media     OICs    Sector Bosses  Field Communications  Field Plant   Field Despatcher
                       Officer         BFB    | |  |  |  |
Reconnaissance Officer                 Police - SES  Crew Leaders    CP Radio Ops    Mechanics     CP Marshall
                                       Aust. Defence   (Crews)       CP Recorder                   CP Timekeeper
                                       (Field Reps.)                                               CP Caterer
                                                                                                  Runners
```
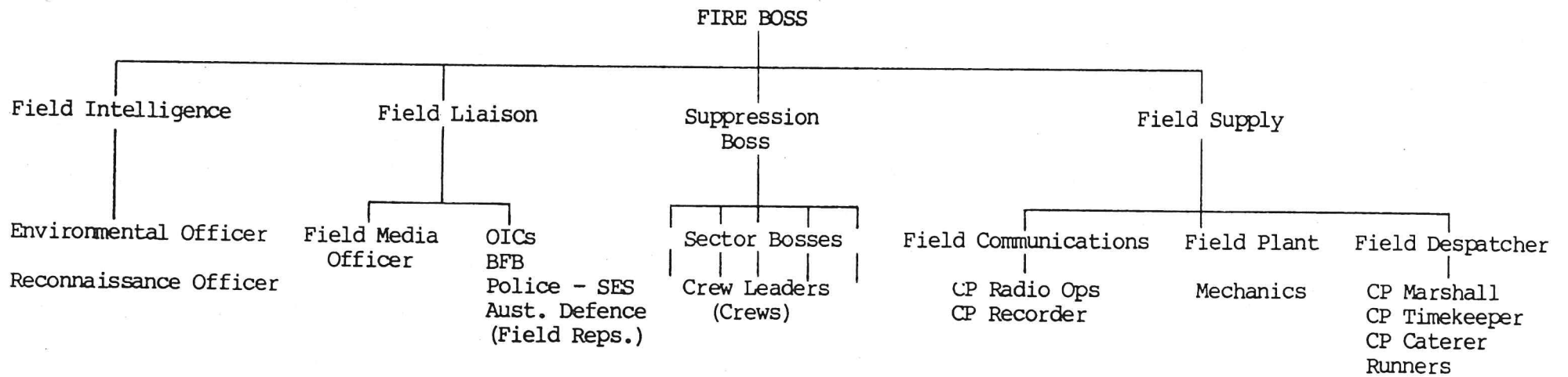
# FIELD COMMUNICATIONS OFFICER

RESPONSIBLE TO: FIELD SUPPLY OFFICER

DIRECTS: Field Radio Operators, Recorders and Radio Technicians.

RESPONSIBLE FOR:

1. Ensuring that a diary of events by time periods is maintained by the Recorder.

2. The recording and passing to appropriate addressee incoming and outgoing messages to or from the Control Point.

3. Ensuring a written summary of important verbal communications concerning the fire situation is maintained.

4. Establishing and adequately staffing in liaison with H.Q. Communications Officer all communications facilities such as radio, radtex, radio fax and mobile telephones between C.P. and field/HQ as required.

5. Establishing a system of Couriers to improve information flow in liaison with Field Despatcher.

6. In conjunction with the Radio Technicians ensures that all Communications systems are effective and compatible with those of other organisations.

## Field Radio Operator Duties

- receives and records incoming messages for distribution to key personnel as directed by the Field Communications Officer.

- transmits written messages approved by the Fire Boss or Field Communications Officer.

- maintains a diary of all incoming and outgoing messages in chronological order.

## Field Recorder Duties

Maintains Field Fire Diary in conjunction with Field Communications Officer and Field Radio Operator.

## CHAIN OF COMMAND

```
                          FIRE BOSS
                              |
        +---------------+-----+-----+---------------+
        |               |           |               |
     Field           Field       Field         Suppression
  Intelligence      Liaison      Supply            Boss
    Officer         Officer      Officer
                                    |
                     +--------------+--------------+
                     |              |              |
                  Field          Field          Field
             Communications      Plant        Despatcher
                Officer          Officer
                     |              |              |
          +----------+----------+ Mechanics        |
          |          |          |        +---------+---------+--------+
        Radio    Technician  Recorder    |         |         |        |
       Operator                         C.P.      C.P.                Runner
                                      Marshall   Caterer      C.P.
                                                           Timekeeper/
                                                            Recorder
```