

INTRODUCTION

AGENDA

- AREC introduction
- History of LandSAR comms
- Use of radio frequencies policy
- Importance of HF
- HF - POLSAR training
- VHF – Icom and new Tait radio training
- VHF- Portable repeater training
- Voice comms procedures

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AREC Introduction

- The objective of Amateur Radio Emergency Communications is to support LandSAR and other emergency services with the provision of experienced radio communications personnel
- AREC is an associate member of LandSAR New Zealand and a member of the New Zealand Search and Rescue (NZSAR) Consultative Committee
- All members of the organization are unpaid volunteers
- Individually licensed amateur radio operators required to meet standards set by Radio Spectrum Management, part of the Ministry of Economic Development

AREC assistance to LandSAR

AREC provides operational support to LandSAR

Offers advice and support with all ICT aspects of SAR

- Operators, Advice, Training
- Equipment specification, Installation, Licensing
- Some areas do not use all services, for example AREC can provide technical support while SAR groups use own operators
- However relationship works best where AREC is integrated into SAR IMT, this is basis for associate membership of LandSAR New Zealand

Radio communications - 1951

- After the Second World War, search and rescue teams began to use war surplus radio equipment for communications
- During the search for lost tramper Stanley Vial, in 1951 this primitive and heavy equipment was used to communicate from the field HQ to town base



Radio communications - 1989

- By the mid 80s the New Zealand made AWA portable radio was in common use for SAR
- This image show the radio in use during the hunt for three Venturer Scouts missing in the Tararua Range in June 1989



Use of radio frequencies – Police & LandSAR policy

- Over the past 10 years under the guidance of the former NZLSAR Communications Sub Committee, the NZ Police have purchased a quantity of VHF and HF radios to adequately fulfill Search and Rescue needs
- All radios comply with the NZ radio regulations and are described as 'type approved' – now a legal requirement
- All Police SAR VHF radios are programmed the same throughout the country with 16 'common' channels in 'Bank 1'
- The ESB repeater channels are only licensed for transportable operation
- Written permission from the various agencies is to be applied for by the owners of the radio – legal requirement

Importance of HF

Still vital tool for remote area communications

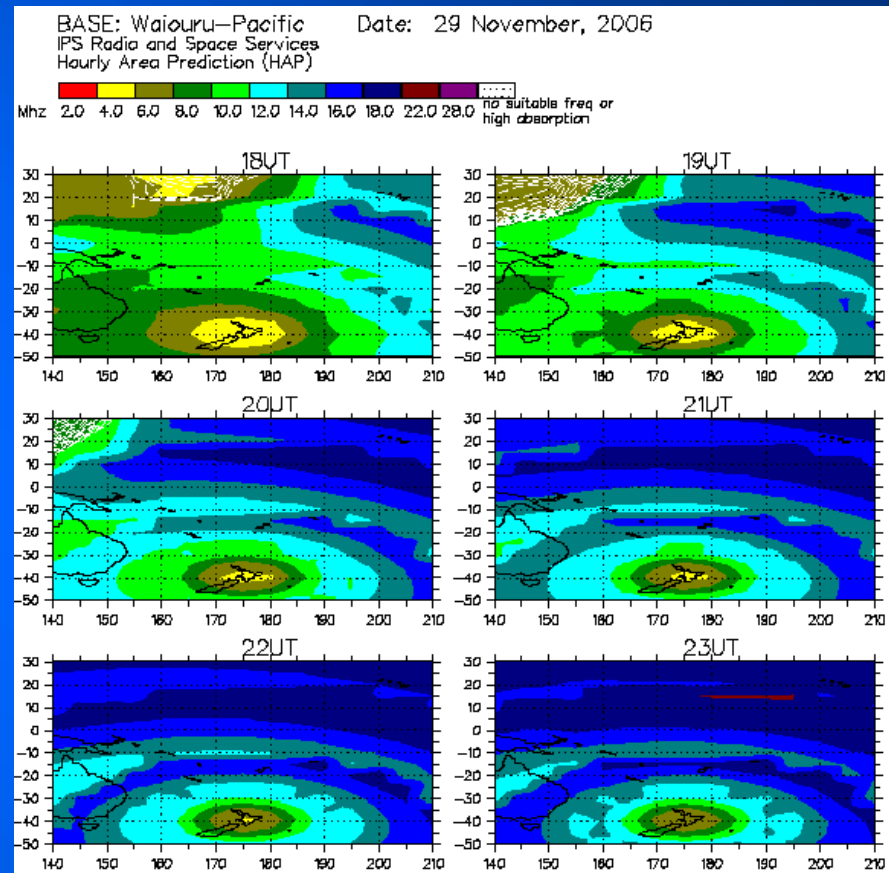
Important that all teams remain completely familiar with HF radio

Telephone interconnects now provide good level of HF service to base locations in otherwise high noise locations

HF propagation sometimes requires expert help (AREC)

IPS Australia predictions available on the web:

www.ips.gov.au





HF Stations Accessible To The Police

HF Station Antenna At Mt Climie



HF equipment - POLSAR



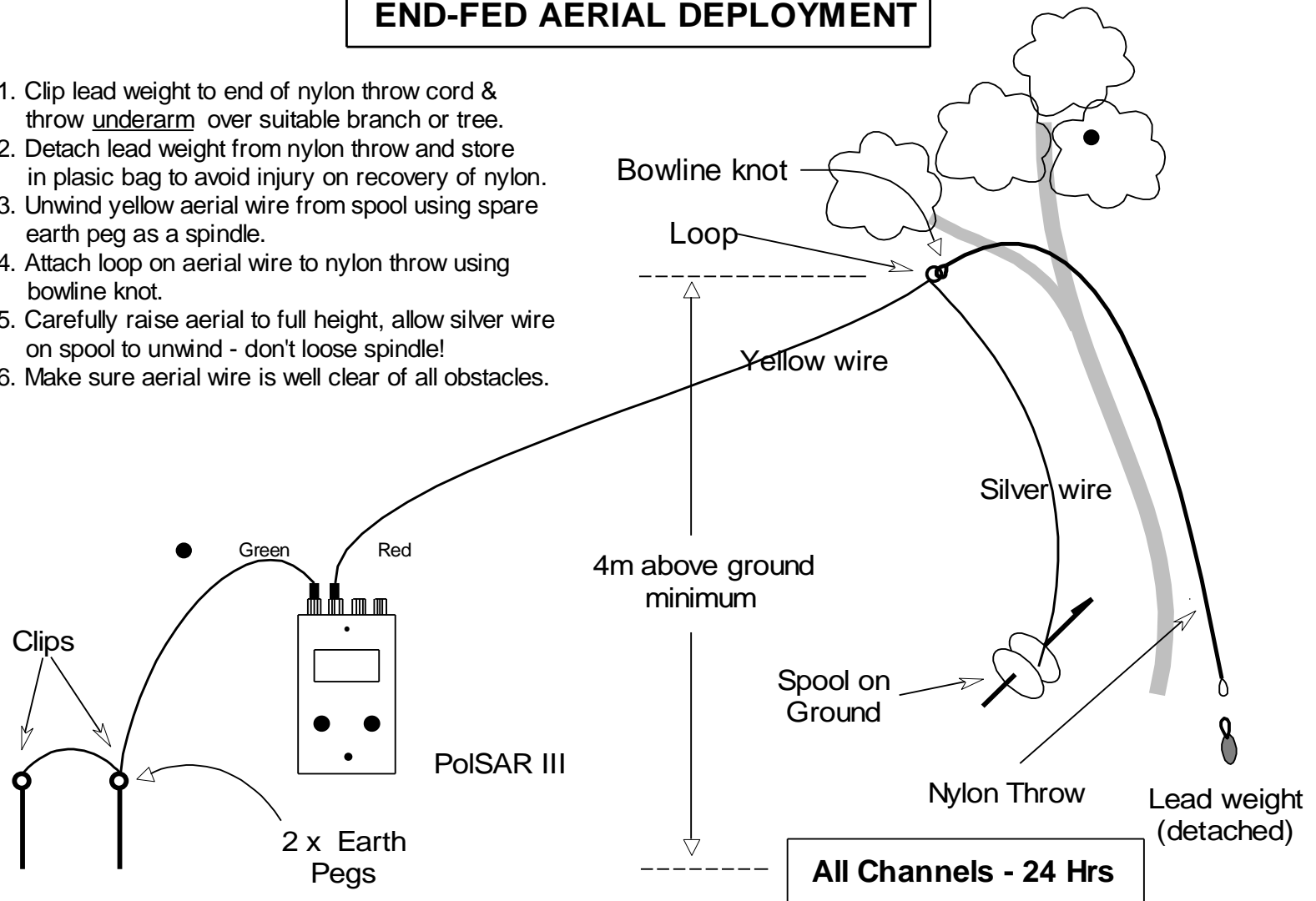
Standard SAR Team Version



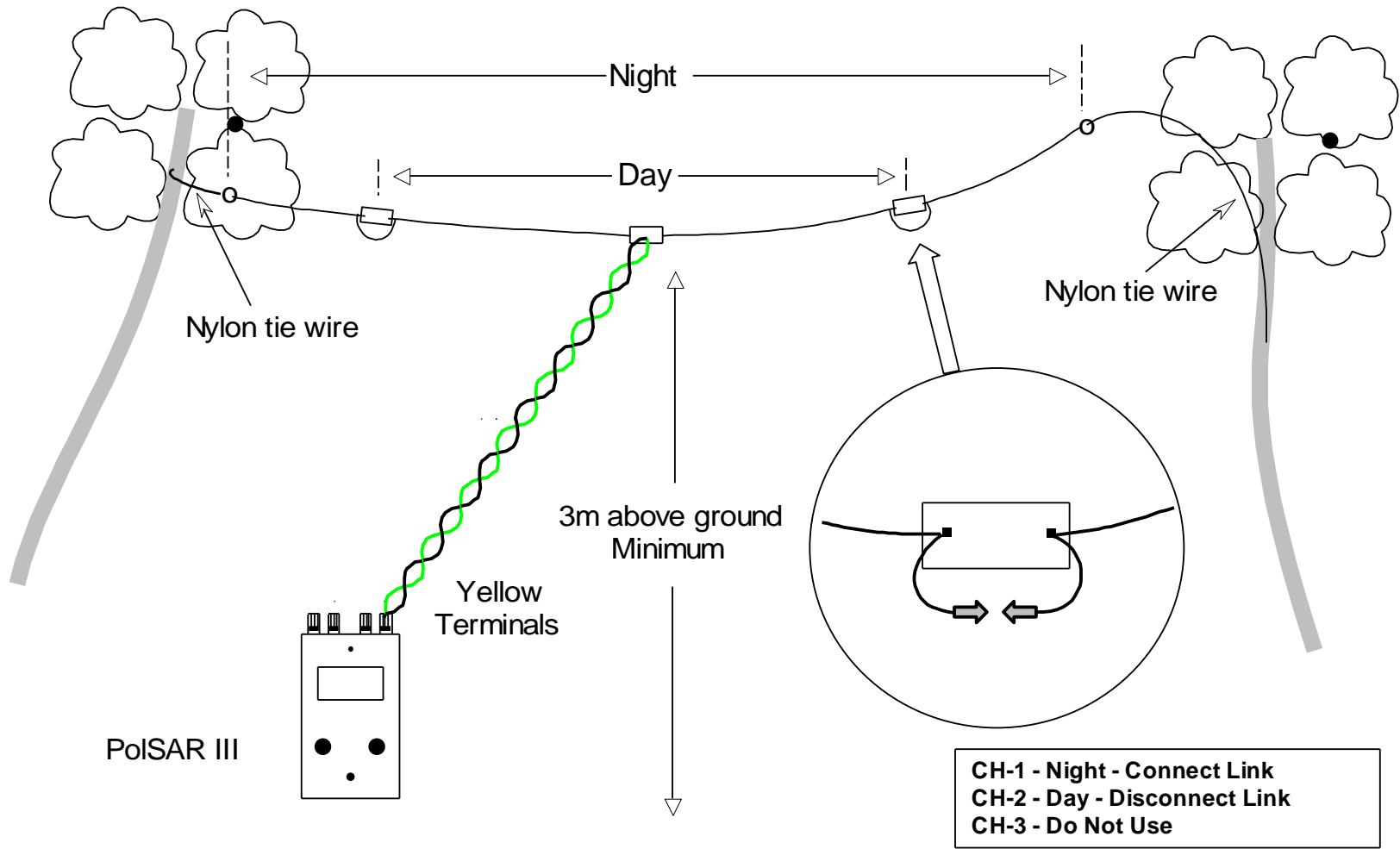
Specialist Group Selcall Version

END-FED AERIAL DEPLOYMENT

1. Clip lead weight to end of nylon throw cord & throw underarm over suitable branch or tree.
2. Detach lead weight from nylon throw and store in plastic bag to avoid injury on recovery of nylon.
3. Unwind yellow aerial wire from spool using spare earth peg as a spindle.
4. Attach loop on aerial wire to nylon throw using bowline knot.
5. Carefully raise aerial to full height, allow silver wire on spool to unwind - don't lose spindle!
6. Make sure aerial wire is well clear of all obstacles.



DIPOLE AERIAL DEPLOYMENT



POLSAR instructions

Erect aerial as per deployment instructions

Connect aerial to appropriate terminals as indicated

- DO NOT connect both aerials simultaneously

Rotate channel switch to correct channel selection

- 1 SAR – Night 3023 kHz 2 SAR - Day 5680 kHz 3 Police - 7

Adjust Volume for comfortable level on background noise

- Check channel is clear of signal

Press PTT button & speak loudly approx 5 cm from MIC hole

- Transmitter will time-out after 1 minute, reset by releasing PTT button

Release PTT button to receive, adjust volume if necessary

POLSAR indicator lights

Battery light 'Batt'

1. Switch POLSAR on to clear channel
2. Lights DO NOT operate on receive
3. Press PTT - DO NOT SPEAK

Green 'Batt' light = good batteries

Red 'Batt' light = flat batteries

It is normal for 'Batt' light to alternate green/red while speaking normally on radio.

Transmit light Tx

- 'Tx' light flashes green at normal voice level

VHF and repeaters

VHF

VHF is more convenient than HF but has limited range

You must stand still when using VHF, your signals will fade if you move the radio when talking

Before contacting base find a good spot where reception is clearest before calling in

Repeaters

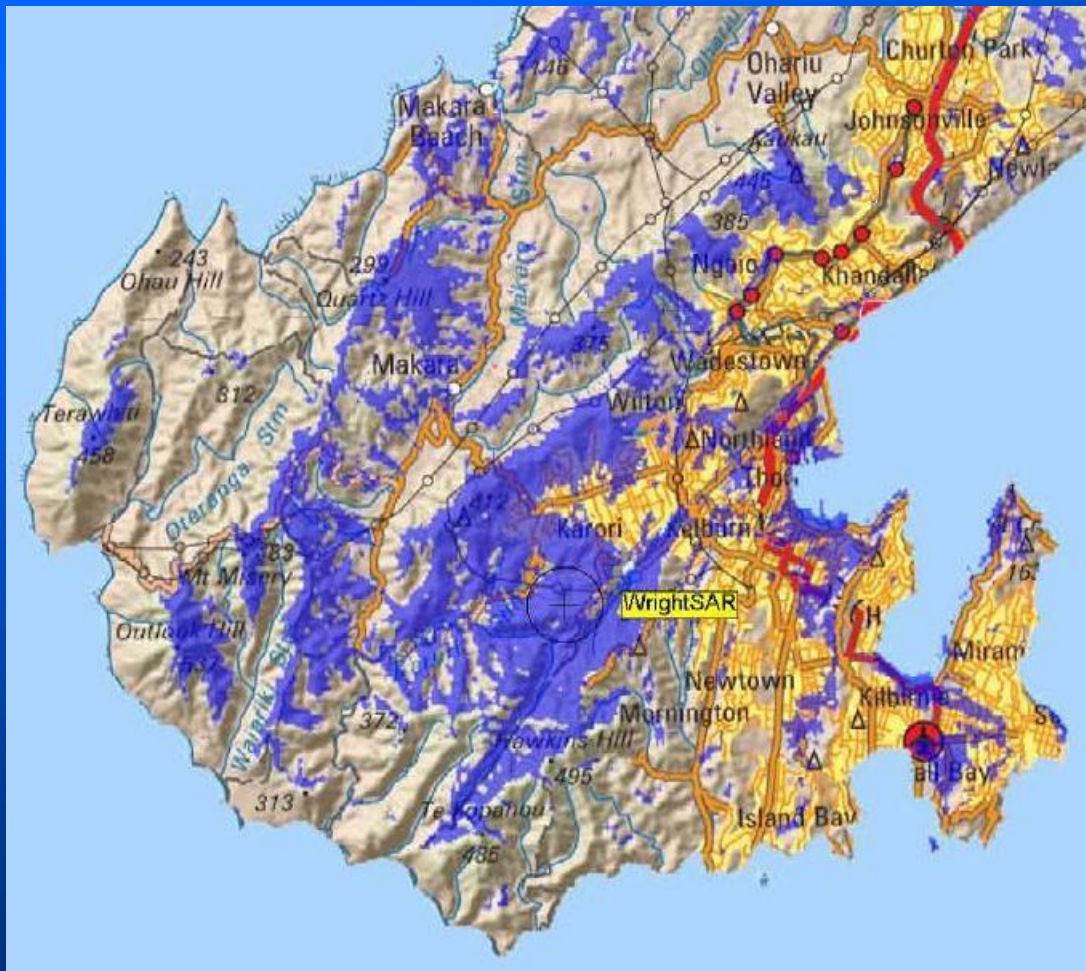
Repeaters extend the line of sight range of VHF communications by relaying the signal from one radio to another

Usually located at an elevated location to give best line of sight range

To use a repeater you need to have line of sight to the repeater

If there is some feature that blocks this line of sight then you will not be able to communicate

VHF – fixed repeaters



VHF coverage prediction

Note shadows from hills

Wellington repeaters:

Wrights Hill

Crowther

Baker

Climie

etc

VHF - Icom F3



Antenna

Volume and on/off switch

Press to talk PTT switch

Transmit LED

Up/down channel select

Display

P0 lock

P3 talk around

P1 high/low power

P2 bank change

VHF – Icom F3 notes

P0 LOCK button

- When this button is pressed for more than one second a KEY symbol will be displayed in the display and the keyboard will be locked i.e. front panel push buttons will not function when pressed
- To unlock press and hold P0 button for more than one second and the KEY symbol will disappear

P1 HI/LOW transmit power button

- Press once and LOW will be displayed in the display press again and the LOW disappears

P2 BANK change

- The ICOM F3 has two banks of sixteen channels use this to swap

P3 talk around

- Press this button bypass the repeater - tk on or tk off will be displayed
- tk on indicates direct and tk off means you are using the repeater
- This only is only in special circumstances – tk off is normal

VHF - Tait TP8100



VHF – Tait TP8100 notes

Key lock key

- When this button is pressed the words KEYPAD LOCKED will be displayed - both the rotary switch and keyboard will be locked
- To unlock press and the X button for more than one second

Backlight key

- Press and the display back light will come on for 5 seconds

Rotary channel select

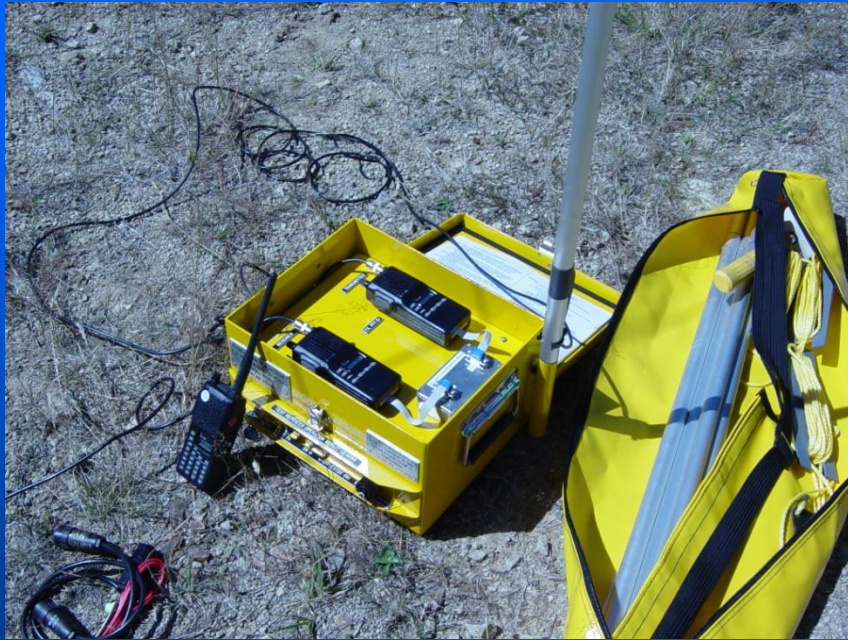
- This knob selects the first 16 channels (National SAR bank 1)

Left and right arrow keys

- Press these keys to step through all available channels
- These keys overrides the rotary knob

Tick key - not used

Portable VHF repeater 'yellow box'



Portable repeater - outside



Antenna connection

On-off switch

External battery connection

Portable repeater - inside



The golden rules

A ACCURACY be sure of what you're saying

B BREVITY keep your message brief and to the point

C CLARITY slow down and speak clearly

Always say the call sign of the station you are calling first.

LOCSTAT be prepared to give your GPS grid position and status.

Never assume – get confirmation your message has been received.

Always have at least two radios. Always take HF (unless urban).

Second VHF ideal for simplex for coordination with other teams
for sound/light or helicopter work.

Voice comms procedure

Speak slowly and clearly

Use correct call signs (see team briefing)

Be to not transmit accidentally

Check that the channel is clear before transmitting

Think or write down your message before transmitting

Confirm that your message has been received – do not assume

***“SAR base, SAR base, SAR base this is Team 1 at grid location
123 456 over”***

Wait for SAR Base to respond and proceed with your message

Terminate each message by saying: - ***“Over”***

Terminate final message by saying: - ***“Team 1 Out”***

Voice comms procedure – pro words

Affirm – Yes

Correction – An error has been made, the correct version is ...

Disregard – Consider the transmission as not sent

I Say Again – I will repeat

I Spell – I will spell the word

Negative - No

Roger – Received the message

Say Again – Please repeat

Standby – Please wait

SARTIME – used by aircraft to indicate the latest time that they should be expected to be back on the ground after which the alarm should be raised.

ADVANCED TOPICS

HF propagation predictions

- Ionospheric Prediction Service is a unit of the Australian Bureau of Meteorology www.ips.gov.au
- Two key tools HAP and LAMPS
- Standard predictions on line updated every hour
- Custom predictions possible
- Needs a bit of work but easy to use
- They are PREDICTIONS!

Hourly Area Prediction (HAP) charts

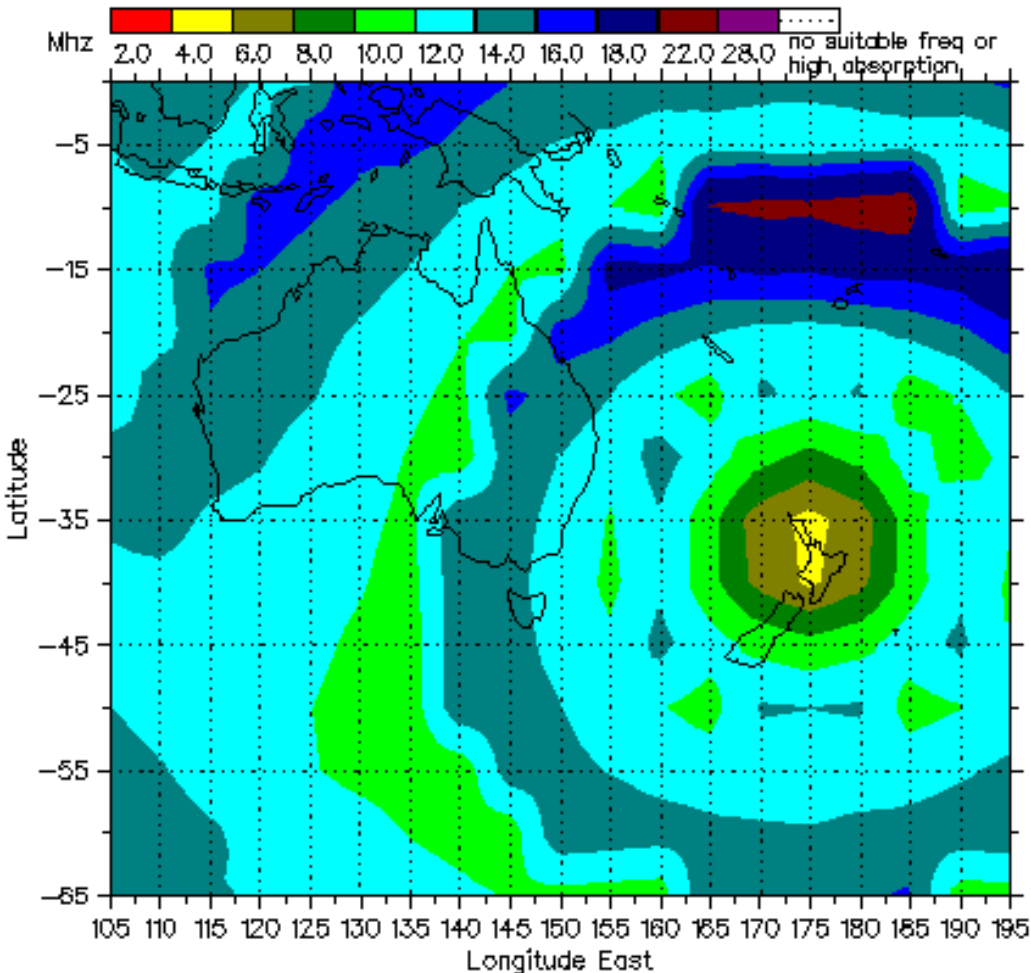
- Prediction charts designed for HF comms between a specified base and mobile within a nominated area
- Chart shows colours for recommended HF frequencies for contacting the base or mobile within the area bounded by the chart for a particular hour
- The geographic zone, which is variable, is represented by a map showing latitude and longitude
- Charts are in Universal Time (UT) aka GMT
- AREC can produce custom HAP charts using the IPS daily forecast T index but standard locations of Auckland and Christchurch are usually good enough

HAP Chart Auckland 21 Nov 2008

BASE: Auckland
IPS Radio and Space Services
Hourly Area Prediction (HAP)

21 November, 2008

Hour: 1 UT



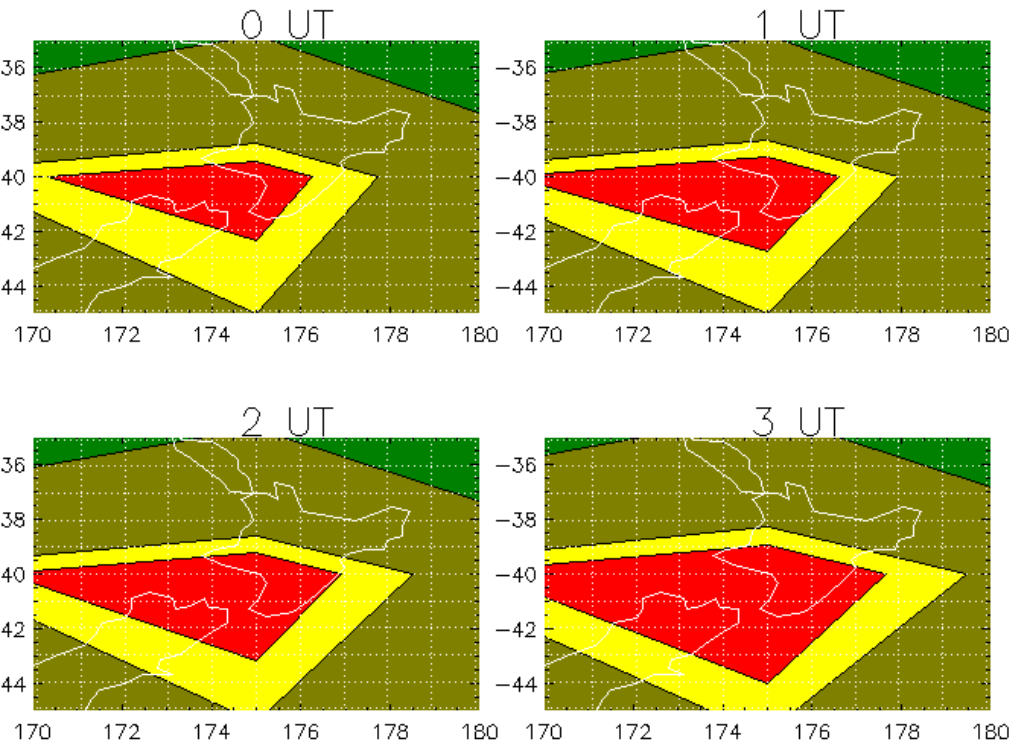
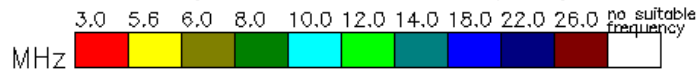
Created at 21/11/2008 01:57:51 UT

Friday at 2pm:

- 5680 kHz Auckland good for comms from N. Cape to P. North
- Police Ch 7 good for Auckland to Nelson

Custom HAP Chart Auckland 21 Nov 2008

Base: WELLINGTON Date: 21 November, 2008 Tindex: -49
IPS Radio and Space Services
On-Line Hourly Area Predictions (HAP)



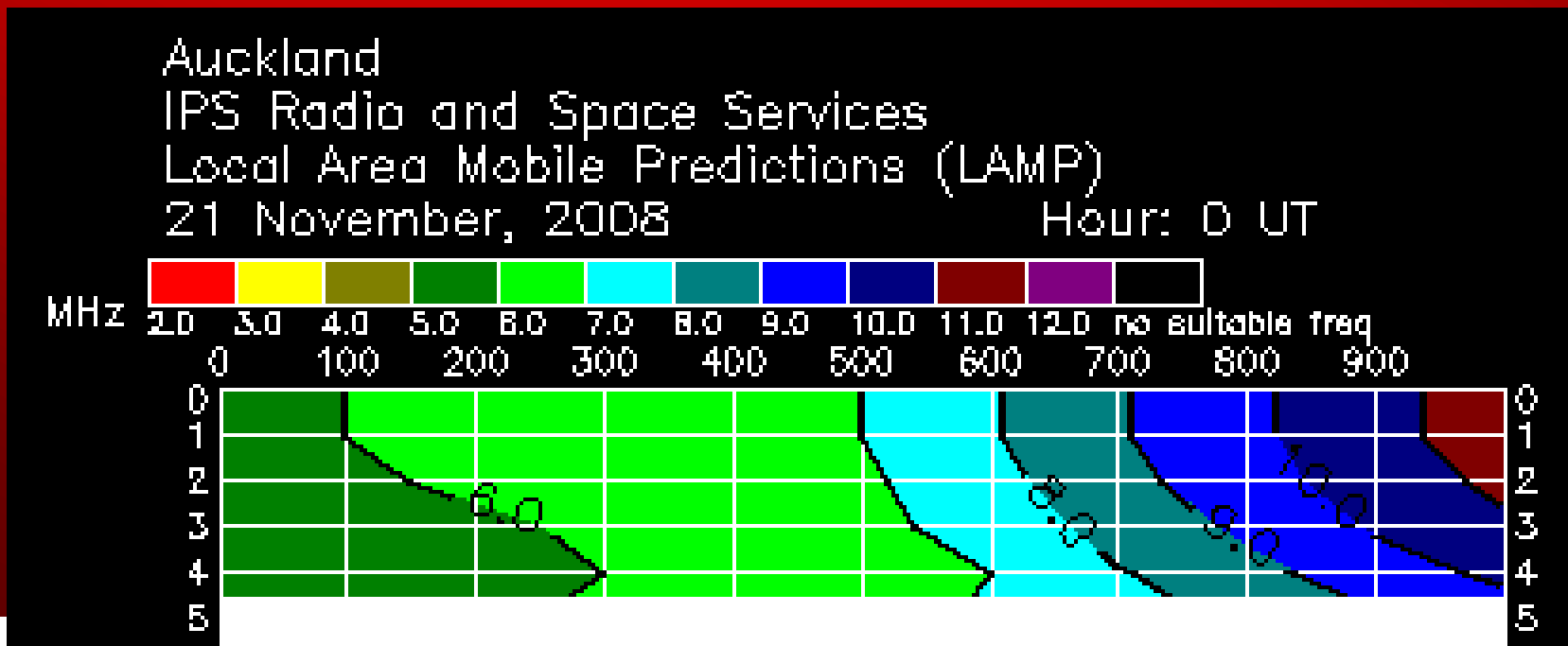
Dashed contours delineate areas where low signal strength may be experienced

Friday at 2pm:

- 3023 kHz Wellington good for comms from Taranaki to Nelson
- 5680 kHz to good for comms to Christchurch and to Taupo, but not in between!

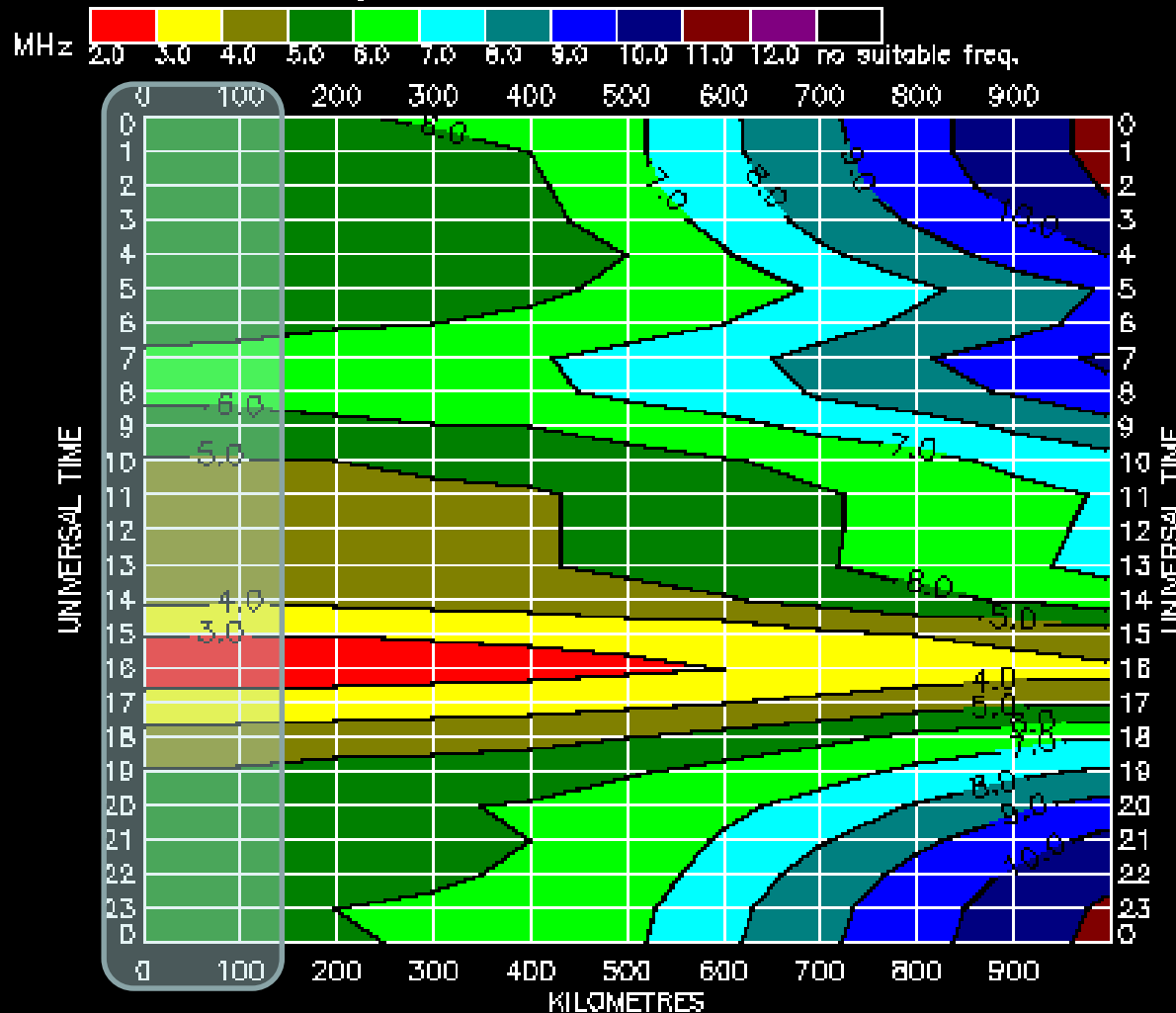
Local Area Mobile Prediction (LAMP) charts

- Predictions for HF comms to portables within 1,000 km of a base
- No geographical information hence the restriction to 1,000 km
- Predictions are in Universal Time (UT) aka GMT
- Distance is shown in either nautical miles or kilometres.
- Frequencies may be in either kilohertz (kHz) or megahertz (MHz).
- The recommended frequency is the intersection of time and distance



LAMP Chart Example

Auckland
IPS Radio and Space Services
Local Area Mobile Predictions (LAMP)
20 November, 2008



5680 kHz

5680 kHz

3023 kHz

3023 kHz

5680 kHz

1pm –
7.30pm

9.30 – 10pm

3 – 4 am

6 – 7am

8 am – 1pm

AREC New Type Approved HF Base Sets

- Provided to AREC in areas with most SAR activity in last 2 years
- First 5 units already in the field fitted with SAR, MRS, & 4WD freqs
- Sets are licensed with individual ZKH series call signs

NEW EQUIPMENT



Cross Band Linking Repeaters

- Portable type approved ESB band VHF – to F band UHF linking
- Used to access remote VHF DoC, CD, and SAR repeaters from base
- Same battery as yellow box repeaters, fitted with low battery drop out
- Unique dual band ESB / F band antenna

NEW EQUIPMENT

