

Boatmaster



THE TWIN TURBINE ENGINE DORNIER 328 IS FITTED WITH THE LATEST TECHNOLOGY INCLUDING FORWARD LOOKING INFRA-RED (FLIR) CAMERA SYSTEM, SATELLITE COMMUNICATIONS AND DIRECTION FINDING EQUIPMENT TO DETECT AND HOME IN ON EMERGENCY BEACON TRANSMISSIONS AND RADIO DISTRESS CALLS, AND SURFACE SEARCH RADAR. LIFE RAFTS AND OTHER EMERGENCY EQUIPMENT CAN BE DEPLOYED FROM THE DORNIER TO PEOPLE IN EMERGENCIES. THE DORNIER IS CAPABLE OF OPERATING AT SPEEDS IN EXCESS OF 600 KILOMETRES PER HOUR, IN ALL WEATHER CONDITIONS AND WILL BE READY TO RESPOND TO AN EMERGENCY WITHIN 30 MINUTES. PICTURED CG171 ASSISTS THE SAR AIRCRAFT WITH A LIFE RAFT DEPLOYMENT ON PORT PHILLIP.

VHF Marine Repeater Network about to go live



Marine communications is about to improve, particularly for vessels boating in coastal waters in the Gippsland region, with the implementation of a repeater network extending across Victoria's coast from Mallacoota to Portland. The project, partially funded by Marine Safety Victoria's Boating Safety and Facilities Program, is currently in the commissioning phase.

Australian Volunteer Coast Guard (AVCG) has been working closely with Marine Safety Victoria (MSV), Telstra, Gippsland Water Police, and Coast Guard Melbourne to ensure VHF marine coverage is extended into key boating locations.

The repeater network's primary function is to complement the Offshore Tracking Sheets (OTS).

Vessel owners planning an extended voyage are encouraged to submit an OTS to a Limited Coast Station (LCS). The OTS will be forwarded to the relevant Coast Guard LCS along the vessel's intended passage.

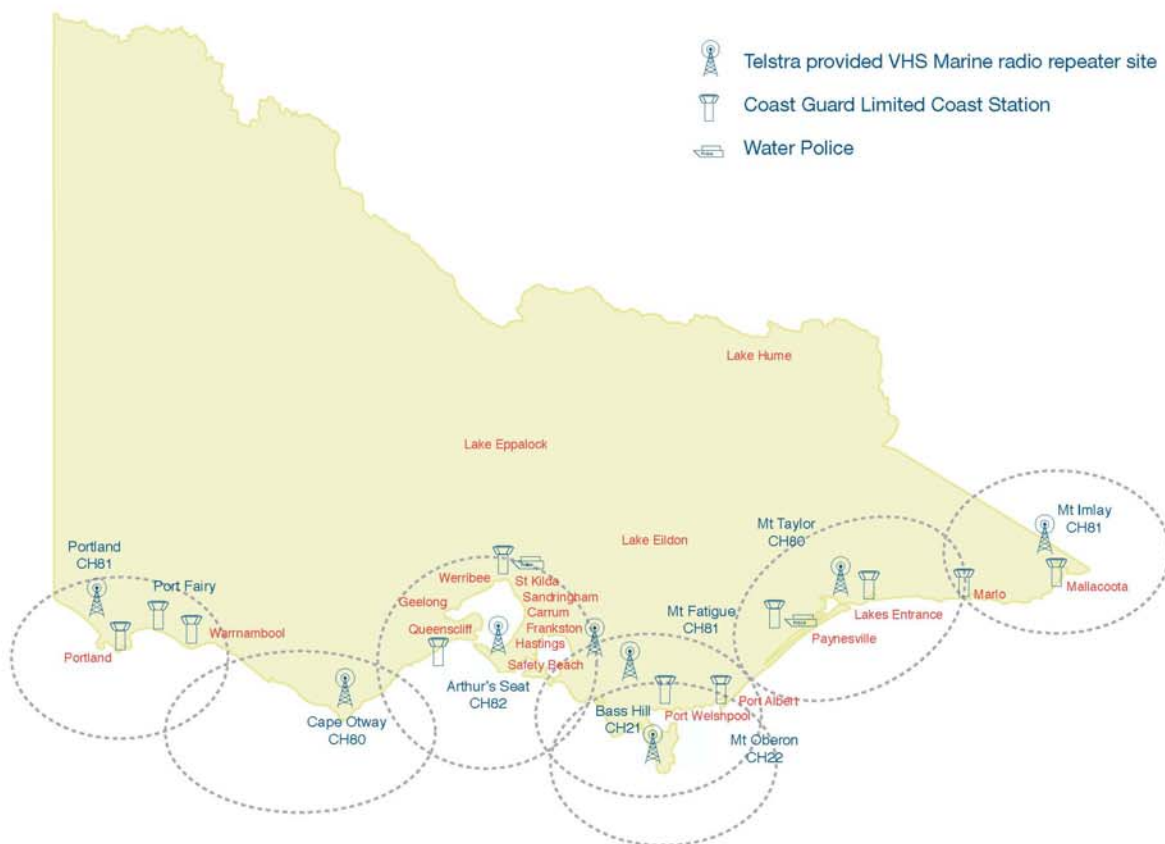
LCS are manned by volunteers and operational hours are often limited to busy periods such as weekends and public holidays. The repeater network, combined with the OTS paper trail, will allow Coast

Guard to maintain a listening watch by resourcing its LCS when vessels are known to be in transit.

Some commercial vessels will also benefit from this service since it will provide radio coverage in areas that are currently only accessible by vessels equipped with other communication mediums, such as HF Radio & Satellite telephone; mediums that cost 3-6 times more than a VHF transceiver.

It is estimated that approximately 250 vessels per year transit Bass Strait, some from as far as South Africa. Most of these vessels will take shelter in Refuge Cove, Wilson's Promontory which, until recently, was blind to VHF communications.

Offshore Tracking Sheets and Repeater information (location and Channel allocation) will soon be available from the MSV and AVCG websites.



-  Telstra provided VHS Marine radio repeater site
-  Coast Guard Limited Coast Station
-  Water Police

Lakes Entrance VF18

Along with our annual exercise with Helimed One there's been enough action over the last 5 or 6 months to keep our members interested. Surprisingly there were only a small number of incidents over the Christmas holiday period. There were also another 2 commercial vessel salvage operations undertaken at the entrance bar.

Lakes Entrance - Entrance Channel

Many of you would have heard about the crisis experienced at Lakes Entrance with the build up of sand between the entrance groynes that effectively closed the port to vessels drawing more than 1.5m, for 2 weeks. The build up of sand was believed to be due to a prolonged period of easterly seas and little or no outflow from the Gippsland Lakes catchment.

To assist the dredges with the removal of the sand earth moving machinery was used to transfer sand one kilometre to east of the entrance channel.



Marine Incidents:- (Since September 2006 3 rd edition)

- 23/9/06 – Towed 5.3m Runabout to boat ramp due to mechanical failure.
- 24/9/06 – Tow drifting runabout to jetty.
- 25/11/06 – Salvage swamped tinny from western side of entrance channel.
- 19/11/06 – Tow half cab to boat ramp due to mechanical failure.
- 31/12/06 – Assist in the positioning of the New Years eve fireworks barge.
- 31/12/06 – Tow Ports punt to Bullock Island due to rope around propeller.
- 2/1/07 – Tow yacht to Metung due to mechanical failure.
- 6/1/07 – Tow yacht to Paynesville due to mechanical failure.
- 7/1/07 – Assist jet ski with engine failure west of Entrance Bar.
- 13/1/07 – Tow 18' half cab to North Arm boat ramp due to engine failure.
- 14/1/07 – Tow Coota boat to western boat harbour due to engine failure.
- 31/1/07 – Assist with salvage of fishing vessel Costella Rosa aground on eastern entrance spit.
- 4/2/07 – Transfer fuel to 20' half cab located outside entrance.
- 17/2/07 – Tow 18' half cab from 10 miles west of entrance due to engine failure.
- 10/3/07 – Assist VF22 with Marley Point overnight yacht race.
- 21/3/07 – Respond to fishing vessel Pasadena Star aground in entrance (vessel re-floated without assistance)

28/3/07 – Assist with salvage of fishing vessel Pasadena Star aground on western entrance spit.

31/3/07 – Assist with search for missing person 1 mile east of entrance bar (person located safe and well)

PORT ALBERT – VF19

The Port Albert Flotilla continues to build on its operations. The new MSV funded 6 metre Zodiac, along with the Cougar Cat, caters for most situations likely to confront us in our region. Members have been busy participating in training programs that enhance their skills and bridge qualifications from their former organisation. We are using the Record of Prior Learning (RPL) mechanism to recognise competencies in order to fulfil unit expectations.

Kevin and Noelene Feltham have decided to relocate from PA to Port Franklin. Because of the short distance to Welshpool, Kevin & Noelene have transferred membership to VF20, Port Welshpool. Their contribution was acknowledged with the presentation of a gift – a small token in comparison to the contribution but one that we hope the Felthams will remember us by. Kevin also received his AVCGA Certificate II Coxswain, presented by SADCO Alan Hopkins, again the RPL process fully recognised Kevin's formal qualifications and experience in SAR from his Coastal Patrol days.

Whilst the Flotilla has lost two good members, Coast Guard still benefits from a communications perspective as Kevin has already finalised plans for the establishment of a limited Coast Station from his home call sign 'CG Port Franklin' – I understand Noelene set some pretty tight specifications for the installation Kevin?

The season has been very quiet from a SAR point of view, no noteworthy assists to mention, hopefully the trend is tantamount to evidence that suggests fatality rates have reduced because of MSV initiatives, however I caution members not to become indolent – inactivity could be directly related to the fire season which has kept the public away from Gippsland – we must always be at the ready 'for those that slip through the MSV safety net!'



Stan Foster at the helm of CG219



Kevin receiving his Coast Guard Coxswain's award from Alan Hopkins SADCO, Left, Stan Foster & Right, Richard Burgess

**Coast Guard Training
conducted by SEAMEC
is funded through the
MSV Boating Safety &
Facilities Scheme
(SAR)**



VF20 – Port Welshpool

Like VF19, we have been fully occupied with training. Our Flotilla Training Officer, Val Young & Charlie Young both attended the Commander's conference conducted at the Yarra Valley Convention Centre, over a weekend. Both reported that a lot was gained from the workshops as well as getting to meet other CG members. The event was well attended by representatives from all Flotilla's across the State. Val also attended the Officer Training Course, conducted at the Port of Melbourne facility.

SEAMEC conducted Pre-Sea training at Port Albert and at Port Welshpool, with the fire units being conducted at Lakes Entrance. An MROCP & First Aid course is also scheduled to be conducted later in the year.



VF19 & VF20 members rehearse survival techniques



Survival at Sea – Port Welshpool



Practice makes perfect



One sole survivor – Charlie Young



Correction 2 sole survivors – Darren Whelan

Marlo – VF21



Events from October 2006 – April 2007

Through funding of grants and our contributions from Memberships, Donations etc, on the 3rd of November 2006 Marlo Flotilla welcomed a new 'Seadoo' Jet Ski to our fleet of Rescue Vessels.

Access to coastal waters, particularly for Marlo Rescue, is limited during most conditions at both the Marlo ramp and Cape Conran boat ramp. The versatility of the Seadoo has already paid dividends during an incident on 2nd December. Our services were called search for a reported missing diver off the beach at Cape Conran. The inflatable Duck skippered by Commander: Jeff Trewin and Gil Chandler accompanied by the 'Seadoo' skippered by Nick Trewin. Both these vessels were launched off the beach at the East Cape Emergency Access point due to the strong South Westerly winds that prevailed at the West Cape Boat Ramp. During these conditions it proved too risky to attempt to launch larger vessels.

After searching for 3 hours information came to hand to mitigate the situation and the search was terminated. However a fuel problem on the CG inflatable resulted in the vessel being towed by the Seadoo to safe waters. Our members are extremely happy with the operation of the Seadoo and its function as a SAR asset.

A successful Boat Licensing day was held at the CFA boat shed on November 26th 2006 with 35 people attending and obtaining both PWC and Boat Licenses. We were very pleased with the attendance and particularly the professionalism of Training Services Victoria – Anthony Woodlands. A rewarding day for all those

present with light refreshments and a 'cuppa' to conclude a well earned achievement. Another Boat Licensing day will be scheduled in the near future.

Orbost held their Annual Christmas Eve Festivities with the closing of the Main Street. An opportunity to meet Santa, as well as rekindle school friendships, most importantly for us, the opportunity for Emergency Services within our community to show their continued involvement. VF21 members displayed our rescue vessels for and took the opportunity to educate our children of the responsibilities associated with our waterways. Teaching the younger generation responsible safe boating operations can never be underestimated, combined with a demonstration on how we respond in an emergency - the scenario reinforcing the notion that, prevention is better than cure.

Again Coast Guard Marlo's attended the Orbost Snowy Rovers Annual Triathlon held in Marlo on 6th January 07. This gave us the opportunity to display our SAR facilities, the Seadoo a welcome sight to several over zealous junior contestants whom, during the swim section, struggled to reach the finish line. Coast Guard's presence essential during such events.

In February, the Coast Guard were called out to assist a boat capsized in the breakers at Cape Conran. The occupants, new to the area, took to the waters ignorant of the local hazards. Shortly after entering the water the motor failed and they drifted 1.6 kilometres into breakers. The vessel capsized but fortunately it was washed onto the beach, the occupants although safely onshore distressed at the loss of their possessions, including a pet dog. The Water Police, Orbost Police and Coast Guard Marlo worked tirelessly in order to retrieve the boat from the beach and tow it back to Point Ricardo.

Vehicle entry to the beach was not possible from Cape Conran so a 6 kilometre trip was made to Point Ricardo. This became a nightmare for all those involved as each vehicle became bogged in the sand. Making what should have been an easy salvage into a mammoth task that extended into the early evening.

Easter once again was a busy boating period, particularly due to the perfect

weather conditions many holiday-makers returning home with good quantities of fish, not to mention stories of the big one that got away.

The local Fete again gave the public the opportunity to view our rescue vessels and the Flotilla the opportunity to recruit new members as well as promote our Associate Membership. Associate Membership helps us to raise funds to keep our assets operational.



Marlo Entrance Pre Flood



Cape Conran ramp



Bush Fires Marlo region



Marlo Entrance Post Flood 1.5 metres low tide.

Paynesville – VF22

New Vessel Update

Paynesville Flotilla VF22 has been very busy since the last Boat Master. The major Raffle to raise funds for our new Rescue vessel has been launched and in fact is due to be drawn Saturday the 26th of May. The major prize is a holiday on a Bulls Cruiser on the beautiful Gippsland Lakes. The value of the prize is \$1500.00.

Due to the recent bush fires and the consequent call on the public for support, the task of selling raffle tickets is quite a tough job. Peter Foxtton, FAO of VF22 has expressed praise for several of our members who are putting in a tremendous effort to sell the tickets, Wyn Bloomer, & Pat Burns are among the leading sellers.

Here at VF 22 we are patiently (some of us) awaiting the arrival of our new 7.6 Stabi Craft rescue vessel. As I write, she is under construction in New Zealand and should be in operation late June or early July 2007. This will mean a new look for Paynesville with a brand new vessel in Coast Guard Livery. This of course will increase our profile in the Gippsland Lakes as well as our capacity to assist on the water.

Some of our recent assists have been to vessels in excess of 13 metres and although our current vessel has done a great job it is not really up to the task.

As we get closer to being an active partner with CFA the need for the new vessel becomes increasingly urgent, as we do not have the capacity to carry Fire Crews & pumps on our existing vessel.

Training

Training has been proceeding at a cracking pace, under the watchful eye of Ray Lyons. As Ray moves more & more into the role of East Gippsland Squadron Training Commodore, David Lyndsay has stepped up to take the training role within the Flotilla.

Recent training courses have included MROCP for aspiring radio operators, Lakes Entrance Professional Bar Crossing course for Paynesville Coxswains & Advanced Crew as well as ongoing training for members in Competent Crew and Advanced Crew studies.

The results of the training schedule are evident in the fact that our ranks of competent crew members is growing. We are still short on numbers for qualified skippers. However we are hopeful of getting funding for some of our members to attend full time training to Coxswain level at SEAMAC Lakes Entrance.

Two of our members, Training Officer David Lyndsay & trainer Horrie Waymouth recently completed and passed the Survival at Sea Training course, and are now able to conduct Survival at Sea Training.

While training is a serious business, some aspects often cause a smile or two, particularly from the participants. At a recent Survive at Sea exercise the camera caught members in all sorts of unusual poses, and the camera never lies.



Happiness is a Huddle



Just one step

Membership

VF22 now has 40 active members and although this may seem like a large number the Flotilla is looking for more members.

As VF22 moves towards greater radio coverage it needs more radio operators to spread the load. Currently operating the radio base 7 days per week from 0730hrs through to 1700hrs means that it is always a struggle to fill the rosters. The mid week roster is a particularly difficult one to fill with many members putting in several shifts per week.

Member Phil Ellis not only sets up the rosters, but spends a lot of time on the radio filling in the gaps. VF22 would welcome any members of the public who would be willing to undertake radio training and assist in ensuring that radio coverage down the Eastern coast of Victoria and in the Gippsland Lakes continues to provide the boating public with up to date information and transit coverage.

Interested persons can contact the radio base on (03) 5156 0106 for further information about membership and training courses.

Fund Raising

Fund raising as many are aware is an onerous but vital task. We are indeed fortunate at VF22 in not only having members willing to take on Fund Raising, but having great local businesses that sponsor us.

In our major fund raising raffle Bulls Cruisers donated a holiday on the

Gippsland Lakes, Bairnsdale Retravision a package of goods & the Paynesville Motor Cruiser Club a dinner for two.

Some fund raising can be fun as you will see from the pictures of the New Years Day Pipe Band Collection and our recent Cocktail Party at Fisherman's Wharf Restaurant. Once again none of these events would have been successful if it was not for the support of local people & businesses.

Lakes navigation Company (Paynesville) Pattie's Foods (Bairnsdale), Fisherman's Wharf Restaurant (Paynesville) & Corky's Liquor (Bairnsdale) to name but a few.

The heart felt thanks of all members of VF22 go to our local businesses and the public for their generous continued support.



Doug Maxwell (owner Lakes Navigation Co.) Leads the pipe band on New Years day.



Enjoying themselves at the Coast Guard Cocktail Party
Representatives from sponsor Patty's Foods

Associate Membership

99 members

Operations

The Radio base has now been operating Seven Days a week for over 6 months and despite the increase required in member hours we have managed to keep it running. With Christmas, Marley Point Overnight race 2007 & Easter being the busiest times in the Radio Room.

VF22 Paynesville Statistics

This year from **October 2006 to April 2007** the following statistics have been accrued:

Number of activations: 35

Number of persons assisted: 60

Number of vessels assisted: 31

**Value of vessels assisted:
\$1,500,000**

**Radio calls 27mHZ & VHF:
2241**

Public Events attended: 25

VF22 man Hours: 6506

Extending VHF coverage across Bass Strait

We are now well into the commissioning phase of the repeater project and starting on the design phase of extending the simplex medium (Channel 16 & 67) into areas identified as 'high traffic locations'.

Marine Safety Victoria has been very supportive in our endeavours to promote the repeater network. Through their Commercial office we were invited to participate in the Commercial Forums conducted across the State.

This presented an opportunity for our Limited Coast Station operators to come face to face with our stakeholders.

Feedback from these forums has been nothing but encouraging. The project team thank all those that attended, participation from our radio operators is a key component to the success of the entire project, and we are encouraged by your support. We are particularly grateful to MSV for the opportunity to participate in the forum program.

MSV, on our behalf, has issued a number of Notices to Mariners (NTM) advising VHF users of the Repeater Project commissioning period. This has been necessary so that users are aware of some of the initial limitations of the system in particular, inter-modulation interference. This comes across as either a blast of noise or even voice not consistent with medium service. It can be annoying, but more importantly, users should avoid scanning (between 16 and other channels including Channel 82 or Channel 80), simply because during periods of frequent inter-modulation periods it is possible higher priority calls will be missed on Channel 16.

During the design phase it was quite a challenge working with both ACMA and TELSTRA in order to allocate frequencies to each site. There are only 5 International Maritime Mobile (IMM) frequencies [Channels 21,22,80,81 & 82] to choose from so trying to allocate a channel that complies with ACMA strict standards, essentially avoiding mixing of frequencies with adjacent carriers that produce spurious

frequencies at unacceptable levels (levels that break the mute threshold).

TELSTRA are working to resolve these issues by the end of the year.

The Mount Oberon project has been particularly successful; we managed the entire project from Method of Procedure to installation, which included the sub-contract arrangements. We could not have done this without the support of Marine Safety Victoria (Lisa Faldon), TELSTRA Country Wide (Gippsland) Jane Oakley, Paul Engler of Motorola, Structel and Noel McCormick of SENTINAR. The rigging and feeder job was awarded to PEACOM Pty Ltd, under the supervision of Phil Peacock, the antenna installation went to plan.

Mount Oberon Channel 22 went to air on Monday 23 April 2007 at 1600. Our Comms Mgr, Marcus Grinblat was present to witness the hand-over and conducted the live tests between CG Port Albert & CG Queenscliff. Although we could not prove the main function of Mt Oberon on the day i.e. reception within Refuge Cove, Kevin Feltham and Stan Foster (CG Port Albert) was able to establish comms with transiting vessels, sheltering within the Cove, a number of weeks later.

Whilst this article puts a lot of emphasis on the project side of things, it goes without saying that the entire network cannot function fully without the support of our Coast Guard Limited Coast Stations (LCS).

From CG Port Fairy in the West (Joan Christie), to CG Mallacoota in the East (Dave Douglas). CG Melbourne, CG Hastings, and all the Satellite Stations.

In Gippsland, Port Albert, Port Franklin, Port Welshpool and of course the huge effort by CG Paynesville whom keep a 7 day roster. And a special mention, Bryn Warrick, CG Tamar Sea Rescue (Tasmania) always on air listening to all Bass Strait traffic and backed up by his No:2 Operator 'Tippie' a Blue Heeler cross whom ensures Bryn never misses a call – evidently he nudges him when a call come in. Sounds like you have it covered Bryn.

Mount Oberon 23 April 2007 Channel 22





OFFSHORE TRACKING SHEET

OTS Reference Number		0	0	0	0	0	0
		y	y	m	m	d	d
Base Location:		Phone:					
		Fax:					
Reporting Vessel Details:							
Name/Callsign:		Registration No:					
Date called:		Time called:					
Radio freq called:		Current Location:					
Vessel Type:		Length:					
Colour – hull:		Colour – Superstructure:					
Communications on board:		27 MHz <input type="checkbox"/> VHF <input type="checkbox"/> HF <input type="checkbox"/> Mobile					
Skipper's Name		Mobile Phone					
Crew 1 Name		Mobile Phone					
Crew 2 Name		Mobile Phone					
Crew 3 Name		Mobile Phone					
Shore Contact		Telephone					
Departed from:		Destination:					
ETA – Date:		ETA – Time:					
Vessel has advised will contact the following bases at the date/time indicated:							
VMRCC	Location	Date dd/mm/yy	Time hh.mm	Date/time contact made dd/mm/yy hh.mm			
Vessel made contact:		Yes <input type="checkbox"/> No <input type="checkbox"/>		Faxed sheet to next VMRCC (see reverse)			
Additional comments:							
Initiate overdue vessel procedure:							
Vessel reported overdue to:		Time: hh.mm		Date: dd/mm/yy			
Name of operator:		Signature:					
Issuing Station - Fax copy to CG Melbourne (Office) 03 9012 4495 AND 03 9521 0748 - file original							
Destination Port - Fax copy of OTS to CG Melbourne (Office) 03 9012 4495 AND 03 9521 0748 to confirm arrival.							

Limited Coast Stations (LCS)

Limited Coast Station	Phone	F ax	E-Mail
CG Melbourne	03 9598 7003	03 9521 0748 AND 03 9012 4495	Squadron.vic@coastguard.com.au Information of an urgent nature or general OTS enquiries - Ring Bruce Archer FC VF12. 0359836235 Private, 0409704721 Mobile.
CG Port Albert	03 5183 2555	03 5183 2466	Stanf@wideband.net.au
CG Welshpool	03 5686 2734	03 5686 2570	kfeltham@wideband.net.au
CG Paynesville	03 5156 0106	03 5156 7304	
CG Mallacoota	03 5158 0407	03 5158 0407	melaleucagrove@bigpond.com.au
RVCP Eden	02 6496 2167	02 6496 3589	
CG Portland	03 5523 6111	03 5523 6111	
CG Port Fairy	03 5568 3252	03 86773341	jobe@dcsi.net.au
CG Tamar Sea Rescue	03 6382 1680	03 6382-3680	chotah@aapt.net.au
VMR 523 America River	08 8553 7301		

Vessel Operator:- Vessel Operators intending on a voyage outside of their home port (not returning to home port on the same day) are encouraged to complete an Offshore Tracking Sheet. Fax this completed OTS to the CG Limited Coast Station ahead of your destination or to the Limited Coast Station at the Port of departure.

Issuing Station to fax copy to Coast Guard Melbourne (Office) 03 9012 4495 AND 03 9521 0748 and file original.

Destination Port to fax copy of OTS to Coast Guard Melbourne (Office) 03 9012 4495 AND 03 9521 0748 to confirm arrival.

“Destination Port” means the *next* Limited Coast Station they will contact, *not necessarily the final* destination.

Australian Volunteer Coast Guard Association Inc. - Victoria
 A small \$50 annual investment that could save your life

Search & Rescue Vessels Marine Radio Watch Marine Safety Courses



Associate Membership Enquiries to:
5156 0106 or download an application & conditions flyer
www.coastguard.com.au/location/victoria/gippsland.html



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 SOUTH EAST AUSTRALIA
 MARITIME EDUCATION
 CENTRE
A division of East Gippsland Institute of TAFE

'Promoting Safety in Partnership'

With your financial support, everyone gets all the help they need!

**Carrum - Frankston - Geelong - Hastings - Lake Eppalock
 Lake Hume - Lakes Entrance - Mallacoota - Marlo - Paynesville - Port Albert - Portland
 Port Welshpool - Queenscliff - Safety Beach - Sandringham - St.Kilda - Warrnambool - Werribee**

The primary objective of our charter is directed towards the safety of lives at sea - Towing vessels is purely the skipper's prerogative. However, abandoning a vessel not only creates a potential navigational hazard, but also leaves the owner facing significant salvage costs, not to mention the inconvenience. It is for this very reason why we choose to tow vessels back to the nearest safe haven.

Join our Associate Membership today in order to receive the benefits of our '**Breakdown Assist**' scheme – a service for Boat Owners whom, for various reasons, find themselves disabled at sea. Your financial support translates directly into helping us keep existing facilities serviceable, crews trained and radio communications coverage extended.

As an Associate Member;

- Your vessel and personal details recorded on our private database (only shared with SAR authorities).
- We issue you with a Radio call sign to use when you wish to call us.
- You can use your membership in other regions of Victoria and Australia where ever Coast Guard Flotilla's exist.(Flotilla locations listed www.coastguard.com.au)
- You will receive a Quarterly Issue of our 'Coast Guard' magazine.
- A discount card to use at the nominated boat dealers.
- Access to other Discounted Nautical courses*

Break Down Assist Helping us, Help You.

*Certificate II in Maritime Operations (Coxswain) only available if application is made for full membership

Technical: RADAR False echoes.

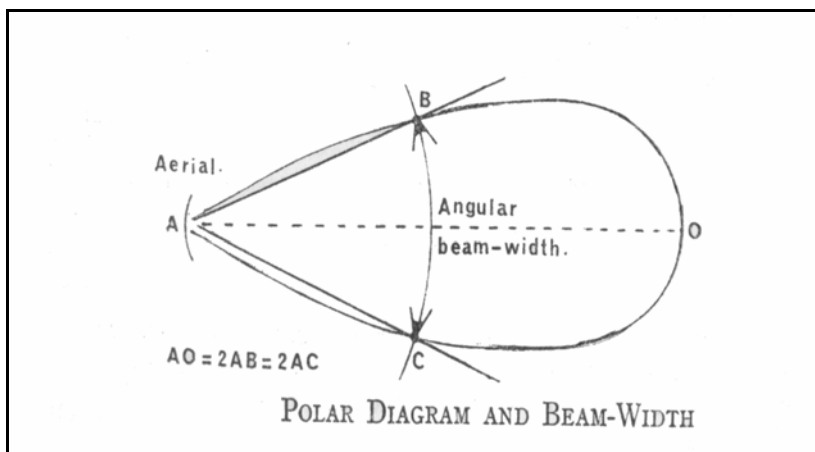


Following on from our last article in BOATMASTER Kevin Feltham asks the following:

“ I read with interest your article on basic radar setup and wonder if you can explain why, at times, some returns take on a ‘curved’ appearance?”

Well Kevin , this is one of many false echoes that you are likely to see on your radar, and put simply, is a result of the size of your radar antenna.

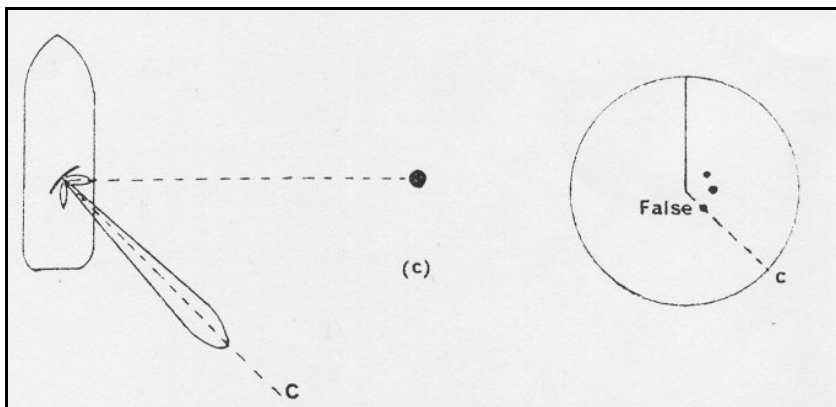
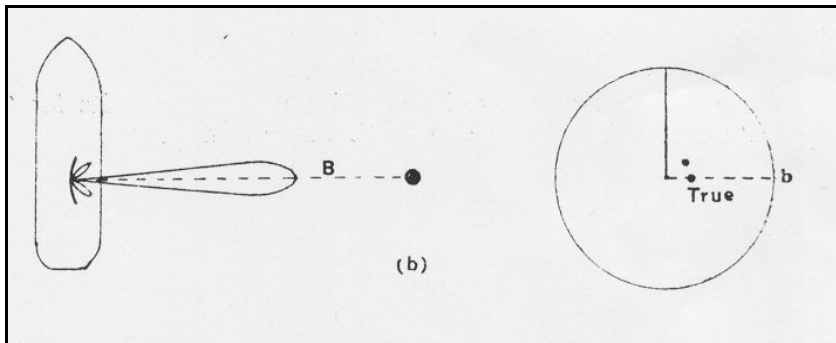
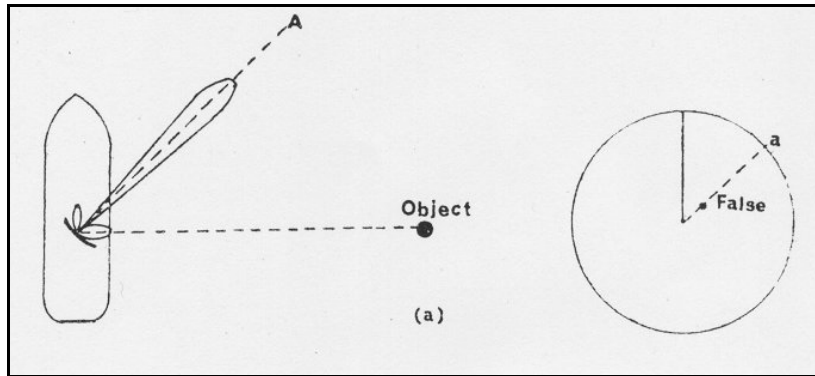
To explain why, we need to look at the pattern of radiation emitted from your radar scanner. The antenna transmits essentially a main beam of radiation like so.



The angle where the intensity of the beam is half of the maximum power emitted (half power point) is termed the horizontal beam width (remember this for later!) **The smaller this angle is, the ‘sharper’ the beam.**

Now, our radar antenna does not only produce this main beam, but also produces what is known as ‘side lobes’ – smaller beams that are weaker than the main and diminish as the angle increases. These side lobes, although relatively small compared to our main beam, are also capable of ‘bouncing off’ a target and painting a return on our radar display.

Side Lobes & False Target Effect



If the side lobes are many, and more significant, the picture painted on our radar display above which show three distinct returns, may actually show one return resembling a semi circular "smeared" appearance.

Now take note of the following:

The **larger** (wider) the antenna --- the **narrower the horizontal beam width** and the **less significant** the side lobes are.

Conversely, the **smaller** the antenna --- the **wider the horizontal beam width** and the **more significant** the side lobes are.

As a rough guide a shore based installation with an 8' antenna would expect to have a horizontal beam width of approx 1 degree or less.

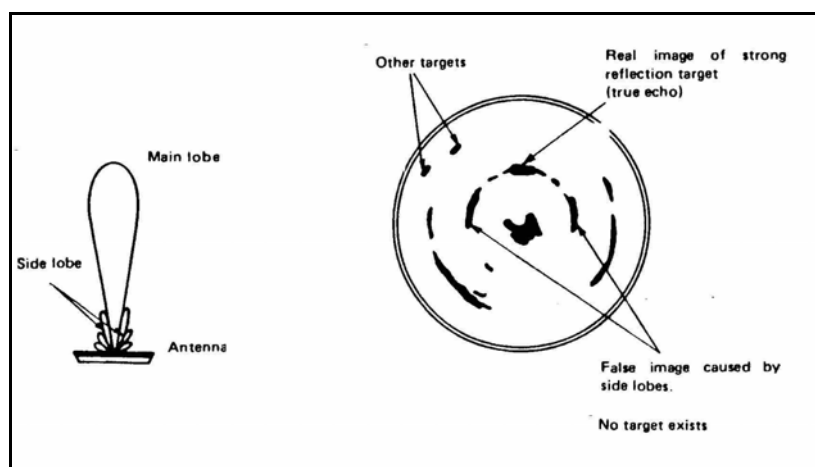
A medium sized vessel installation with a 4' antenna would produce about a 2 degree horizontal beam width, and, at the other end of the scale we have small radars with approx 1' antenna which produce as much as a 6 degree horizontal beam width.

So we are saying small antenna size produces:

- less gain (therefore range) ,
- wider horizontal beam width, and
- greater side lobes.

Consequentially, what happens here is that at relatively close ranges the leading side lobe transmission reaches the target and is returned, the main (relatively wide) beam returns signal over a wide arc, then the trailing side lobes return enough signal to also paint a picture.

The result of all this is a single target that appears 'smudged' like so:



This target should only appear as one dot.

The situation is one of a catch 22, whereby technology produces radar receivers that are more and more sensitive in order to pick up weak signals reflected from targets further away by getting away with using small antennas which have less gain, but only to exaggerate the side lobe affect.

So how do we minimize this annoying problem?

Well, firstly, as rescue boat operators we need to carefully choose a radar that has a moderate size antenna (or larger) --- not the smallest we can find.

All very well if we are still to purchase, but using what we may already have the problem can be minimized by applying a little more anti-sea clutter than the conditions call for and/or reduce the overall gain (sensitivity).

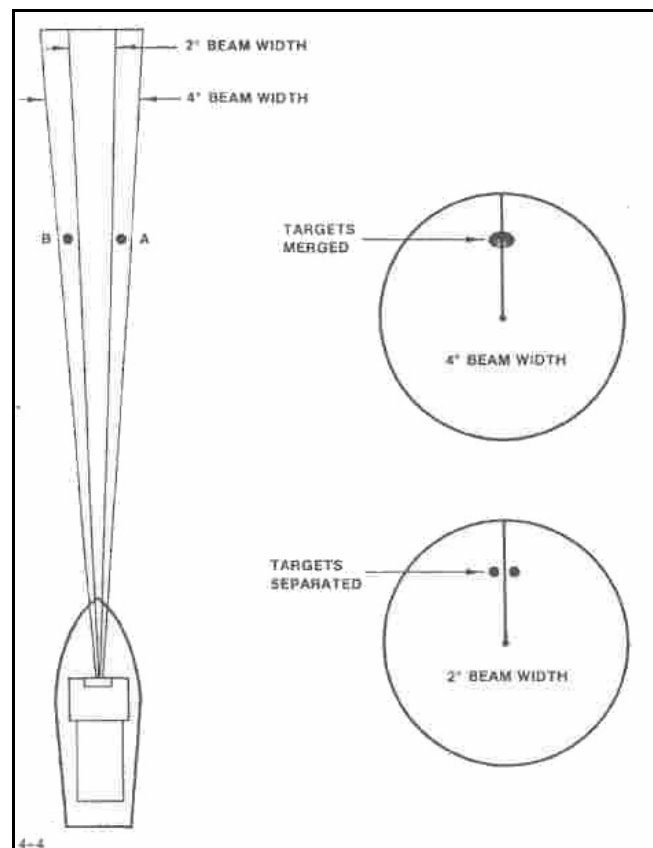
This really does become a balancing act between acceptable picture and acceptable detection if looking for something. Changing pulse length may also help at times.

The side lobe effect is also exaggerated when targets that produce a very good return are close by e.g. a ship beam on, or other large metallic objects.

4th Edition

Last edition we looked at the horizontal beam width produced by our radar antenna and saw how a broad horizontal beam width can produce bigger side lobes and as a consequence of this targets can appear “smudged” and curved, instead of one crisp dot, well...Guess what? There are other consequences resulting from a broad horizontal beam width -- that of horizontal bearing discrimination.

If our radar has a relatively large horizontal beam width, say greater than 4 degrees, and look at the scenario below of two vessels, B and A, relatively close to each other and at the same range from us then the two vessels will be ‘hit’ by the beam at the same time resulting in the display of one target when in actual fact there are two. The targets will be merged.



However, If we have a nice narrow horizontal beam angle, say 2 degrees or better, and look at the above scenario of the two vessels, B and A, then we see that the beam will detect vessel B first, then a gap, then vessel A.

The targets will be separated and appear as two distinct objects

As radar operators we must be aware of the horizontal beam width of the radar we use in order to predict what bearing discrimination (or lack of) we may expect.

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Technical: Marine Repeaters, how they work.

Now that the Coast Guard has established Repeaters along most of Victoria coast, it is timely that we reiterate what a repeater is and its benefits to us.

The repeaters that are currently in the trial phase are what are known as “**Talk-Through**” repeaters. Irrespective of how this is technically achieved, it simply takes our transmission on one frequency and re-broadcasts it on another.

This happens at the same time i.e. whilst you have the PTT (Press to Talk) button down the repeater is receiving your transmission on the input frequency of the assigned repeater channel and transmitting it on the output frequency of the repeater.

In order to do this, the channel assigned for a repeater has to have one frequency for receive and another for transmit.

These channels are known as **DUPLEX** channels as opposed to **SIMPLEX** channels which receive and transmit on the same frequency e.g **CH16 and CH 67**.

This is why **SIMPLEX** channels cannot be used for Talk-Through repeaters. If it tried to transmit on the same frequency as it was receiving a station on (at the same time) then the repeater would lock out receive nothing.

There are only a handful of duplex International Marine channels that are assigned for repeater use. Once a repeater is out of its theoretical range, the channel can be allocated again - not less than three repeaters apart.

Some further points to consider:

Since the repeaters are usually situated high up, often a remote hill top or sometimes a high tower or other structure, the range is considerably more than if you were talking on a simplex channel boat to boat. Remember VHF is line-of-sight. The repeater may have a 40 NM radius of usable range which means that if two vessels are in opposite direction to the repeater in the above example, the effective boat to boat range will be 100 NM.

Any marine station has access to the repeater as long as they have the appropriate duplex channel. Most, if not all, marine radios have the full 55 international channels fitted.

Remember – a duplex channel receives on one frequency and transmits on another. This switching is done internally in the radio when you press the PTT switch and let it go. As such, unless you and the station you are talking to are within range of the repeater you will not hear each other – even if you are only half a mile apart! **Each radio is listening for the repeater and not listening to the input to the repeater.**

The other thing that most repeaters have built in is a small delay between when you stop transmitting on the input to the repeater and when the repeater stops transmitting on its output. This delay can typically be between 1 sec. and 4 sec. and is known as the repeater **TAIL**.

This can be used to see if we can access a repeater, or not, by selecting the appropriate repeater channel for the area we are operating in and momentarily pressing the PTT button on that channel (only after we are sure it is not in use) and listening for the repeater **TAIL**.

This also gives an indication of how strong the repeater is back to you. No tail – means you are not “getting into” or “triggering” the repeater. A noisy tail – means you are probably noisy into the repeater as well.

A noise-free tail – usually means you are getting into the repeater fairly well. Most repeaters, when you are on the fringe of their range, will transmit better than they will receive your signal due to the equipment used and power levels at either end.

A word of caution. Make sure your radio has 'International' channels selected and not 'USA' or 'Canadian' as only International has duplex operation on the repeater channels assigned in Australia and New Zealand.

You will not be able to trigger a repeater with anything other than International even though you may be easily within range.

As operators of Coast Guard Base Stations, your signal into your 'local' repeater will not normally vary.

The Coast Guard Repeater Network in Victoria consists of the following:

REPEATER	CHANNEL	AREA of COVERAGE
Mt. Imlay	81	Eden, Mallacoota - Marlo
Mt. Taylor	80	Marlo - Seaspray
Mt. Fatigue	81	Corner Inlet, south to Deal Island
Mt. Oberon	22	Port Albert, Wilson's Prom Sth.
Bass Hill	21	Westernport to Cape Liptrap
Arthurs Seat	82	Westernport, Port Phillip, Immediate Coastal areas
Cape Otway	80	Cape Otway – Port Fairy
Portland	81	Port Fairy – SA border.

Refer to coverage maps for the predicted area each repeater will cover.

As Coast Guard base operators, we will normally work through the repeater which covers our normal area of operations – even though we may be able to get into a repeater further away we would not normally broadcast weather on a repeater that is 'out of area' e.g. weather for Port Phillip being broadcast on Wilson's Promontory repeater taking up air time.

Also remember if someone calls up on Ch16, it may be best to change to the local repeater channel as a working channel. Exceptions to this rule is where you know you have good transmission to a station on simplex therefore no need to tie up repeater channel unnecessarily.

Base stations should constantly monitor their local repeater.

As time goes on and boat operators become aware of, and comfortable with, the repeaters you will find boats will call direct on the repeater channel rather than going through CH16.

Experience in New Zealand has found this to be the case. Remember though that all vessels should still be encouraged to monitor CH16 whilst at sea. Most will probably opt to dual watch CH16 and their local repeater.

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