

19. INFORMATION CONCERNING SUBMARINES

Warning Signals

1. Mariners are warned that considerable hazard to life may result from the disregard of the following signals which denote the presence of submarines:

(a) **Visual signals.** Australian warships fly the International Code Group "NE2" to denote that submarines which may be submerged, are in the vicinity. Vessels are cautioned to steer so as to give a wide berth to any vessel flying this signal. If from any cause it is necessary to approach her, a good look-out must be kept for submarines whose presence may be indicated only by their periscopes or snort masts showing above the water.

(b) **Pyrotechnics and Smoke Candles.** The following signals are used by submerged submarines:

<i>Signal</i>	<i>Signification</i>
White smoke candle (with flame).....	Indicates position in response to request from ship or aircraft or as required.
Yellow smoke candles	
Yellow and green pyro flares.	Keep clear. I am carrying out emergency surfacing procedure. Do not stop propellers. Clear the immediate area, but stand by to render assistance.
Red pyro flares.....	
(may be accompanied by smoke candles repeated as often as possible).	

Note: If the red pyro flare signal is sighted and the submarine does not surface within 5 minutes it should be assumed that the submarine is in distress and has sunk. An immediate attempt should be made to fix the position in which the signal was sighted, after which action in accordance with *paras 13-20* should be taken.

2. It must not be inferred from the above that submarines exercise only when in company with escorting vessels.

Australian Submarine Exercise Area

3. The note *Submarine Exercise Area* on certain charts should not be read to mean that submarines do not exercise outside such areas. The whole of the Exclusive Economic Zone (EEZ) is a permanently established Australian submarine exercise area. Under certain circumstances warnings that submarines are exercising in specified areas may be broadcast by a coast radio station or promulgated in printed navigational warnings.

Navigation Lights

4. Submarines have their masthead and side lights placed well forward and very low over the water in proportion to the length and tonnage of these vessels. In particular:

- (a) some submarines can only show a forward masthead light in calm confined waters;
- (b) in other submarines the forward masthead light may be lower than the sidelights;
- (c) the main masthead light may be well forward of the mid-point of the submarine's length.

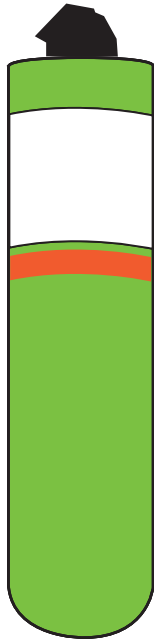
5. Stern lights are placed very low indeed, and may at times be partially obscured by spray and wash. In some cases the stern lights will be well forward of the after part of the submarine, and thus will not give a true indication of the submarine's length. They are invariably lower than the side lights.

6. The after light of nuclear submarines at anchor is mounted on the upper rudder which is some distance astern of the hull's surface waterline. Care must be taken to avoid confusion with two separate vessels of less than 50 metres in length.

7. The overall arrangement of submarine lights is therefore unusual and may well give the impression of markedly smaller and shorter vessels than they are. Their vulnerability to collision when proceeding on the surface and the fact that some submarines are nuclear powered dictates particular caution when approaching them. Nearly all submarines are fitted with an amber quick-flashing light situated above or abaft the main steaming light. This additional light is for use as an aid to identification in narrow waters and areas of dense traffic. Australian submarines will normally burn this identification light under the above conditions and when entering or leaving harbour at night.

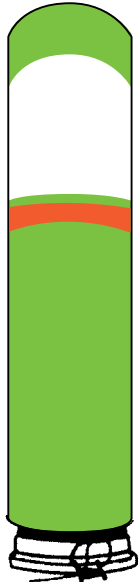
8. Australian Collins Class submarines exhibit a very quick flashing yellow identification light (120 flashes per minute) **VQ. Y.** This identification light should not be confused with an air cushion vessel operating in a non-displacement mode which displays the same light.

Candle Smoke White Mk 4 N



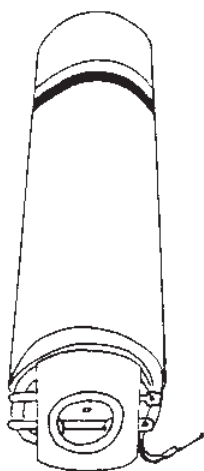
Description	Green, red and white, with red and black markings
Length	42.5cm
Diameter	9.5 cm
Content	Calcium Phosphide
Duration	15 mins – white smoke and flame

Candle Smoke White Mk N6



Description	Green, red and white, with red and black markings
Length	42.5cm
Diameter	9.5 cm
Content	Red phosphorous – Two detonators
Duration	Four mins – white smoke

Float Signal Submerged (Grenade) Mk N3



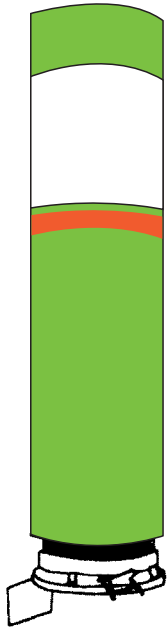
Description	White and black, with black and red markings
Length	43 cm
Diameter	10.2 cm
Content	Two detonators, one ejection charge, one grenade Signal (green/red)
Duration	5 sec – a coloured star is ejected to 91 metres.

Float Signal Submerged Mk N4



Description	White and black, with black and red markings
Length	40 cm
Diameter	10.2 cm
Content	Two detonators, one ejection charge, one fluorescein dye in a green canister.
Duration	No time element: The container is ejected 6 metres splitting the dye canister.

Candle Smoke Yellow Mk N7

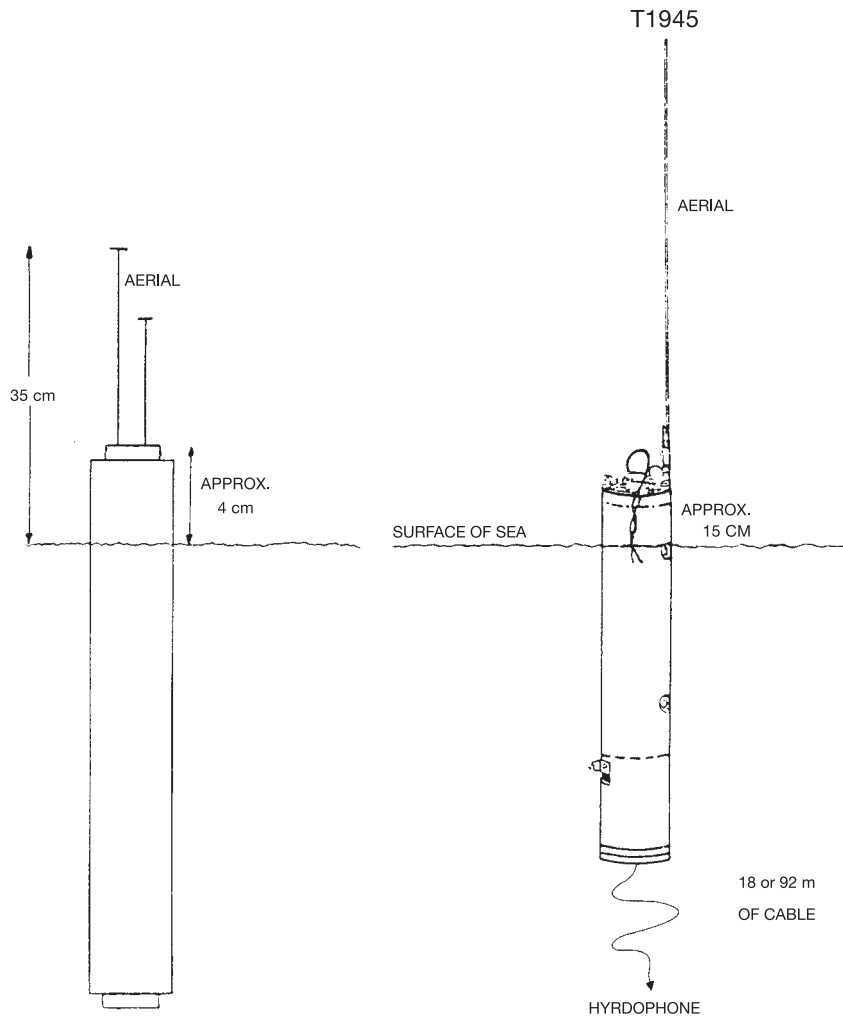


Description	Green, red and white, with red and black markings
Length	42.5cm
Diameter	9.5 cm
Content	Smoke composition — Two detonators
Duration	4 mins — yellow smoke

Marker Location Marine Mk25



Description	Silver body, black gasket 2.5cm white band
Length	46cm
Diameter	7.6 cm
Content	Red phosphorous
Duration	16 mins — smoke and flame
Caution	An explosive charge is fitted, fragmentation to 8 metres



Submarine Launched Emergency Communications Buoy

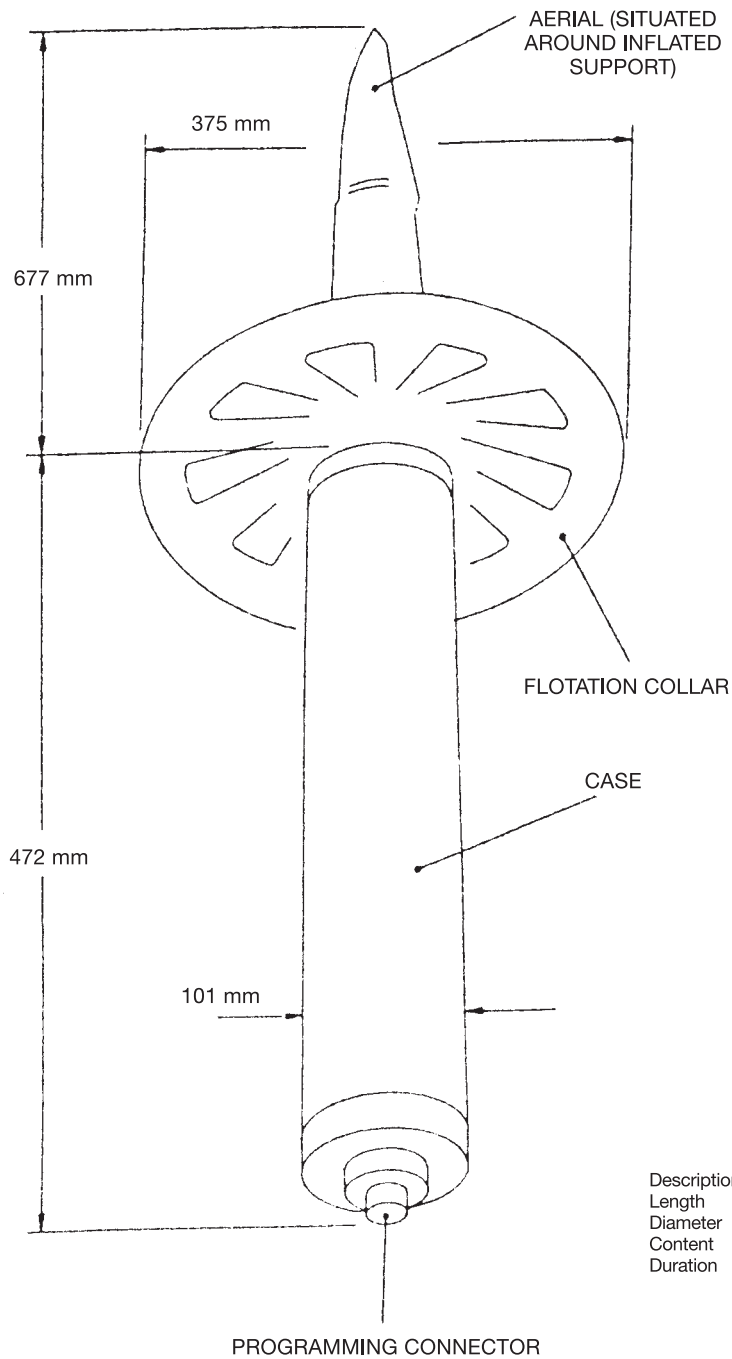
Description	Orange
Length	86cm
Diameter	10cm

Rough Drawing Sonobuoy

Description	Grey
Length	72-6m
Diameter	5-2m

Expendable Communications Buoy (ECB)

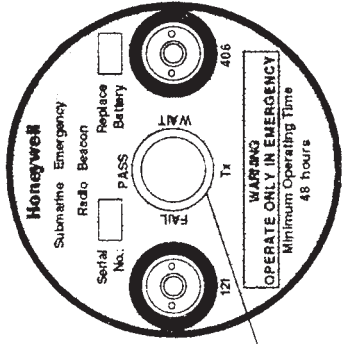
Submarine Launched Flare D4A2



Description
Length
Diameter
Content
Duration

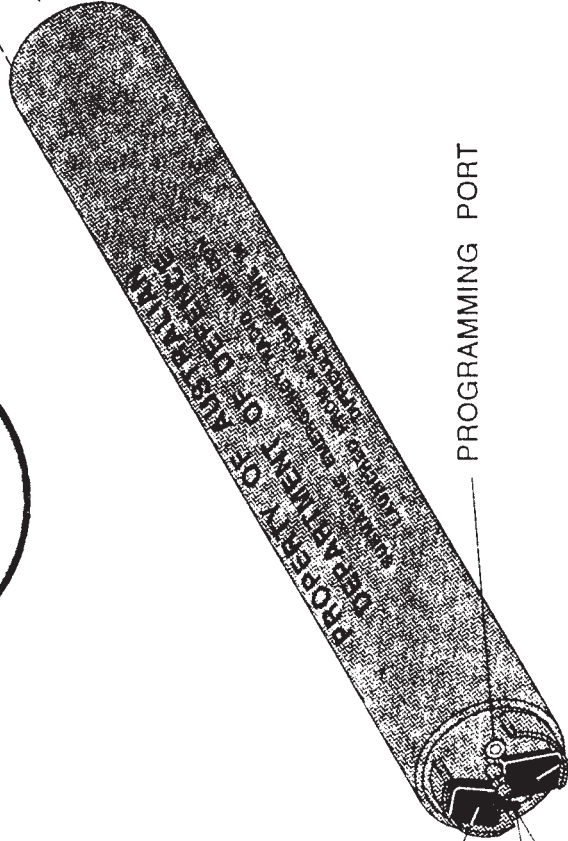
Silver body, white markings
1 m
7.6 cm
Red, Green or White Flares (Magnesium)
30 - 40 secs. A flare is ejected to 170m
Red flare nose cap is buoyant, coloured fluorescent red, contains dye marker and may contain a message.

Description Silver



INDICATOR LED'S

DOTTED LINES
INDICATE ANTENNA
POSITIONS AFTER
FIRING

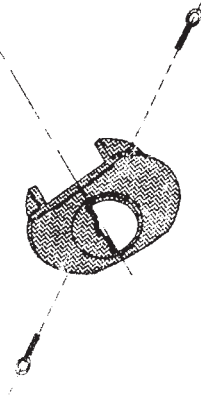


ACTIVATION SWITCH

PROGRAMMING PORT

DE-ACTIVATION PIN

TEST SWITCH



ACTIVATION PLATE
REMOVE SPLIT PINS ONLY
PLATE WILL SEPARATE FROM
SERB ON FIRING

Description:
Length: 54.4 cm
Diameter: 10 cm
Orange

SUBMARINE EMERGENCY RADIO BEACON

Sunken Submarine

9. A bottomed submarine which is unable to surface will try to indicate her position by firing candles giving off yellow or white smoke either on the approach of surface vessels or at regular intervals.. As far as possible yellow candles will be used by day.

Note: It should be remembered that it may be impossible for a submarine to fire her smoke candles. Correspondingly a partially flooded submarine may have only a certain number of her smoke candles available and searching ships should not therefore expect many to appear.

10. Since oil slicks or debris may be the only indication of the presence or whereabouts of the sunken submarine, it is vitally important that surface ships refrain from discharging anything which might appear to have come from a submarine while they are in the submarine probability area. Searching ships and aircraft can waste many valuable hours investigating these false contacts.

11. Some submarine pyrotechnics can be fitted with message carriers. If a message has been attached, the pyrotechnic will be fitted with a dye marker, giving off a yellowish-green dye on the surface. Such a pyrotechnic should be recovered as soon as it has finished burning.

12. Collins Class submarines are fitted with the purpose Submarine Launched EPIRB (SERB). A description of the SERB is given at *para 20*.

13. The sighting of any beacon answering the attached description should at once be reported by the quickest available means to the Rescue Co-ordination Centre Australia, the Navy or Police. However, if vessels are unable to establish communications without leaving the vicinity of the submarine, it should be borne in mind that the primary consideration should be for vessels to remain standing by to rescue survivors and not leave the scene of the accident. Every effort should be made to include in the report the serial number of the beacon; this number is affixed on top of the SERB (see *para 20*).

14. At any time after a submarine accident survivors may start attempting to escape. Current policy dictates that survivors will wait before escaping until:

- (a) rescue vessels are known to be standing by; or
- (b) conditions inside the submarine deteriorate to such an extent that an attempt to escape must be made.

15. It should be noted that, in certain circumstances the situation *para 14(b)* may not arise through lack of air supply until a time after the accident of several days. However, if the submarine is badly damaged, survivors may have to make an escape attempt immediately. Any ship finding a SERB should not therefore leave the position but stand by well clear ready to pick up survivors. The latter will ascent nearly vertically, and it is plainly important plenty of sea room is given to enable them to do so in safety. On arrival on the surface men may be exhausted or ill, and if circumstances are favourable therefore the presence of a boat already lowered is very desirable. Some men may require a recompression chamber, and it will therefore be the aim of the Naval authorities to get such a chamber to the scene as soon as possible.

16. In order that those trapped in the submarine shall be made aware that help is at hand, Navy vessels drop small charges into the sea, which can be heard from inside the submarine. There is no objection to the use of small charges for this purpose; but it is vital that they are not dropped too close since men in the process of making ascents are particularly vulnerable to underwater explosions and may easily receive fatal injuries. A distance of a quarter of a mile is considered to be safe. If no small charges are available, the running of an echo sounder or the banging of the outer skin of the ship's hull with a hammer from a position below the water-line is likely to be heard in the submarine, and such banging and/or sounding should therefore be carried out at frequent intervals.

17. Submarines may at any time release pyrotechnic floats, which on reaching the surface burn with flame and/or smoke thus serving to mark the position of the wreck. They are likely to acknowledge sound signals by this means.

18. To sum up, the aims of a submarine rescue operation are:

- (a) To fix the exact position of the submarine.
- (b) To get a ship standing by to pick up survivors if practicable with boats already lowered.
- (c) To get medical assistance to survivors picked up.
- (d) To get a diver's decompression chamber to the scene in case this is required by those seriously ill after being exposed to great pressure.
- (e) To inform the trapped men that help is at hand.
- (f) To notify appropriate authorities.

19. There is a large Navy organisation designed to fulfil these aims which is always kept at instant readiness for action. It is clear, however, that any ship may at anytime find evidence of a submarine disaster, and if she takes prompt and correct action as described above she may be in a position to play a vital part.

Submarine Emergency Radio Beacon (SERB).

20. This beacon is made of aluminium, coloured orange and is cylindrical in shape, with two whip aerials. The beacon is fitted with an automatic transmitting unit, battery life of 48 hours operating on the following frequencies:

- (a) 406.025 MHz Cospas/Sarsat.
- (b) 243 MHz Military Air Guard.
- (c) 121.5 MHz Civil Air Guard.

Submarine Launched Expendable Communications Buoy (ECB).

21. This buoy is used for tactical communications between submarines and warships/aircraft. It can, however, be fired in an emergency default mode in which case it will transmit a SABRE tone on 243 MHz Military Air Guard. Physical description of the ECB are shown in the drawing on *page 90*.

22. The accompanying diagrams on *pages 86-91* show Submarine Emergency Radio Beacon (SERB), Expendable Communications Buoy (ECB), smoke candles fired from submarines, sonobuoy, and aircraft float, smoke and flame markers. A general description of each is as follows:

- (a) *White Smoke Candles*. These are fired from submarines to indicate their position. They burn for up to 15 minutes emitting white smoke and flame and can thus be seen day or night; they can easily be confused with aircraft marine markers and floats smoke and flame.
- (b) *Yellow Smoke Candles*. These are fired from submarines to indicate their position. They burn for about five minutes emitting yellow smoke. They can be seen more easily than the white smoke candles in rough weather but cannot be seen at night.
- (c) *Sonobuoys*. These are dropped from aircraft to detect submarines and may be countered anywhere at sea. Other countries have similar sonobuoys but their colour and dimension are not known.

23. The above may frequently be encountered in areas where HMA Ships and Aircraft exercise, whether or not submarines are present, and should not be confused with submarine emergency buoys and beacons. In case of doubt the object should be approached to confirm, visually, whether or not it is a submarine emergency buoy or beacon before reporting it.

24. The following is a list of candle smoke and markers currently used by the RAN and RAAF:

- (a) Submarine Bubble Decoy Mk N2
- (b) Schermuly Icarus Band Radar flare
- (c) Marker Man Overboard, Smoke and Light Mk N3 and Series 2
- (d) Marker Location Marine Mk 25
- (e) Float Signal Submerged Mk N4
- (f) Float Signal Submerged (Grenade) Mk N3
- (g) Candle Smoke Yellow Mk N7
- (h) Candle Smoke White Mk N6
- (i) Candle Smoke White Mk 4N
- (j) Submarine Launched Flare D4A2

