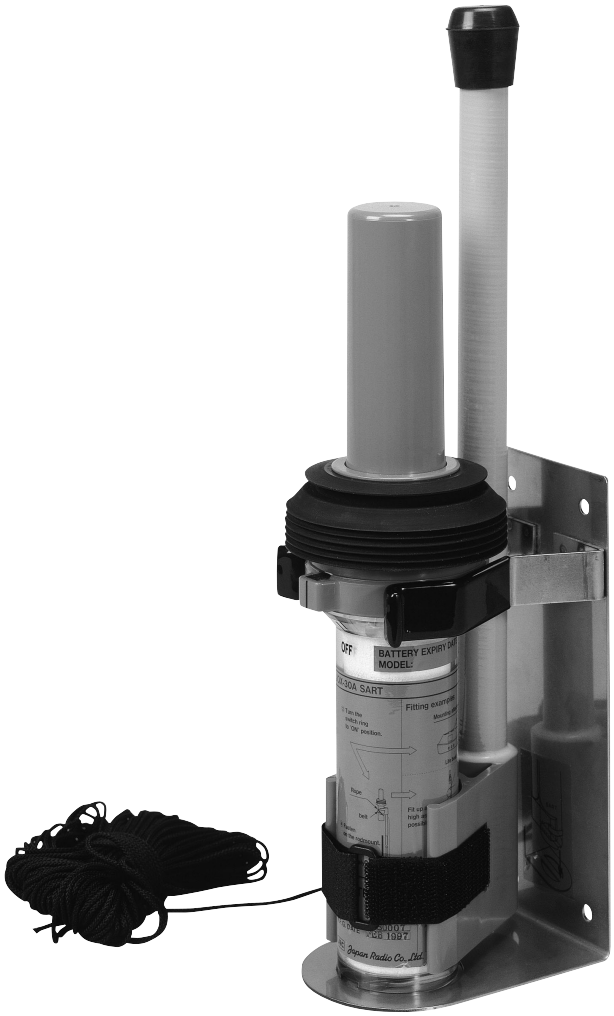
REVISED JAN. 1999

JQX-30A

SART (SEARCH AND RESCUE RADAR TRANSPONDER)
RADAR TRANSPONDER

INSTRUCTION MANUAL



JRC Japan Radio Co., Ltd.

Preface

Congratulations on your selection of the JRC Search and Rescue Radar Transponder JQX-30A.
This equipment is used for locating survivors in accordance with the GMDSS (Global Maritime Distress and Safety System).

- Before attempting to operate it, read this instruction manual thoroughly to correctly and safely operate this unit in accordance with the warning instructions and operation procedures in this manual.

- Storing this instruction manual carefully for future reference is highly recommended. In the event that you have an operational problem or malfunction, this manual will provide useful instructions.

Before Operation

Pictorial Indication

Various pictorial indications are included in this manual and are shown on these equipment so that you can operate them safely and correctly and prevent any danger to you and/or other persons and any damage to your property during operation. Such indications and their meanings are as follows.

Please understand them before you read this manual:

⚠WARNING	This indication is shown where any person is supposed to be in danger of being killed or seriously injured if this indication is neglected and these equipment are not operated correctly.
⚠CAUTION	This indication is shown where any person is supposed to be injured or any property damage is supposed to occur if this indication is neglected and these equipment are not operated correctly.

Examples of pictorial indication

Electric shock

The △ mark represents CAUTION (including DANGER and WARNING). Detailed contents of CAUTION ("Electric Shock" in the example on the left.) is shown in the mark.

Disassembling prohibited

Prohibition

The ⃠ mark represents prohibition.
Detailed contents of the prohibited action ("Disassembling Prohibited" in the example on the left) is shown in the mark.

Disconnect the power plug

Instruction

The ● mark represents instruction.
Detailed contents of the instruction ("Disconnect the power plug" in the example on the left) is shown in the mark.

Handling Precautions

⚠WARNING

Do not operate this equipment for any purpose other than in a distress situation or for inspection purposes.

This equipment contains precision parts constructed with a waterproof outer cover. Do not attempt to disassemble or modify this equipment. Otherwise, it could result in fire, electric shock or malfunction.

Observe the following precautions when handling the battery.
Prohibited actions:

- Do not incinerate battery.
- Do not expose the battery to temperatures over 70℃.
- Do not short circuit the battery.
- Do not attempt to operate this equipment with a battery other than that specified for use in this equipment
- Do not attempt to recharge the battery.
- Do not forcibly discharge the battery power.
- Do not use the battery for any purpose other than instructed.
- Do not disassemble or otherwise damage the battery.
- Do not expose the battery to condensation. Do not leave the battery outside or in a location with high temperature or humidity.

Ignoring the above precautions could result in explosion, fire or poisonous gas exposure.
If poisonous gas is exposed, immediately ventilate the location.

Do not attempt to service the interior of this equipment. Only professionals we qualified to service the interior of this equipment. Self-service could result in fire or malfunction. Contact our branch office or agency for service.

Handling Precautions

⚠CAUTION

When installing this equipment, select a location with a wide view. Install so that the antenna is vertical to the sea surface and that the height of the antenna is 1 m or more above sea level. Failure to do so may result in obstruction of the radar and rescue signal reception.

Periodically check the battery expiration date and that the battery power is sufficient to operate in an emergency. Contact our branch office or agency for battery replacement before the expiration date expires.

The battery used in this equipment is a primary battery and can not be recharged.
Do not dispose of the used or expired batteries as garbage. Return all used or expired batteries to our branch office or to the battery manufacturer.

While taking into account the structure of the life raft, decide how and where to install this equipment in advance. Then inform the entire crew of this location and the necessary installation procedure.

While not in use store this equipment in a well ventilated location away from direct sunlight, rain, sea spray and condensation.
If this equipment malfunctions, send it immediately to our branch office for maintenance.

Do not install this equipment in a location where vibrations or impacts are likely to occur. Otherwise, the equipment may drop or turn over, resulting in personal injury or malfunction.

SART is equipment intended for use in rescue situations. Avoid false transmission. If this happens, or the equipment is found to be transmitting false, immediately proceed as follows.

(1) Turn the switch off and terminate operation.
(2) Inform the Maritime Safety Agency of a false transmission.

Contact:
Maritime Safety Agency (Japan)
[TEL: 03-3591-9000, INTERNATIONAL TELEX: 222-5193 JMSAHQ-J]
or the nearest division of the Maritime Safety Agency to your present location.

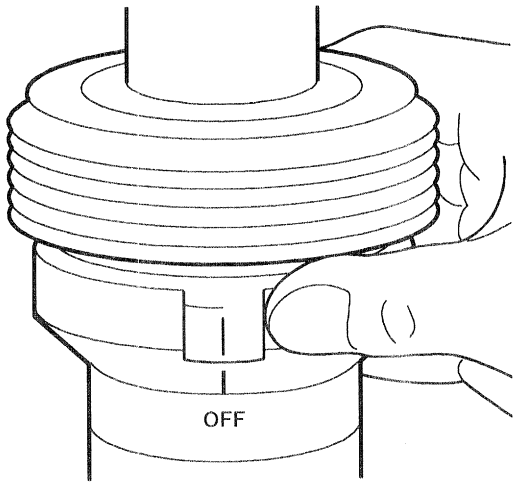
When operating this equipment, observe the procedures described in this Instruction Manual or refer to the operating instructions inscribed on the label affixed to the main unit.

Emergency Operating Procedure

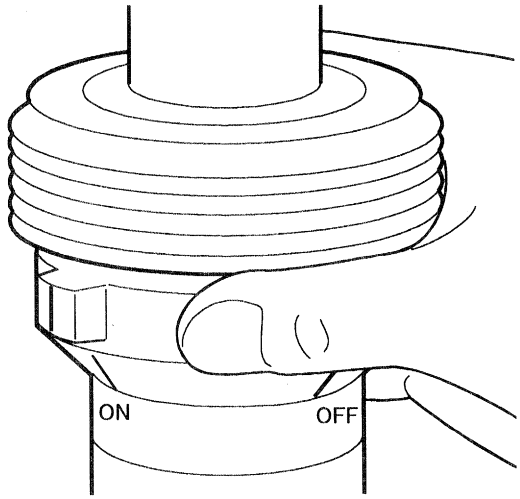
Activate the equipment according to the following procedure during a distress or emergency situation.
The stand-by mode lasts up to 96 continuous hours(4～5 days).

Procedure

1. Rotate the switch ring to the "ON" position as shown below.
2. Confirm that the green lamp (LED) near the "ON" mark lights up.
3. Select a location with a wide view and install SART(this equipment) at as high a level as possible (at least 1 meter above sea level). Secure SART with the attached rope so that it is positioned vertically (within ±10°). When installing SART, be sure that the red lamp (LED) under the switch ring can be easily seen. When radar signals from rescue ships or aircraft are detected, the red lamp lights up intermittently. As the radar signals approach, the red lamp changes from intermittent light to a continuous light.

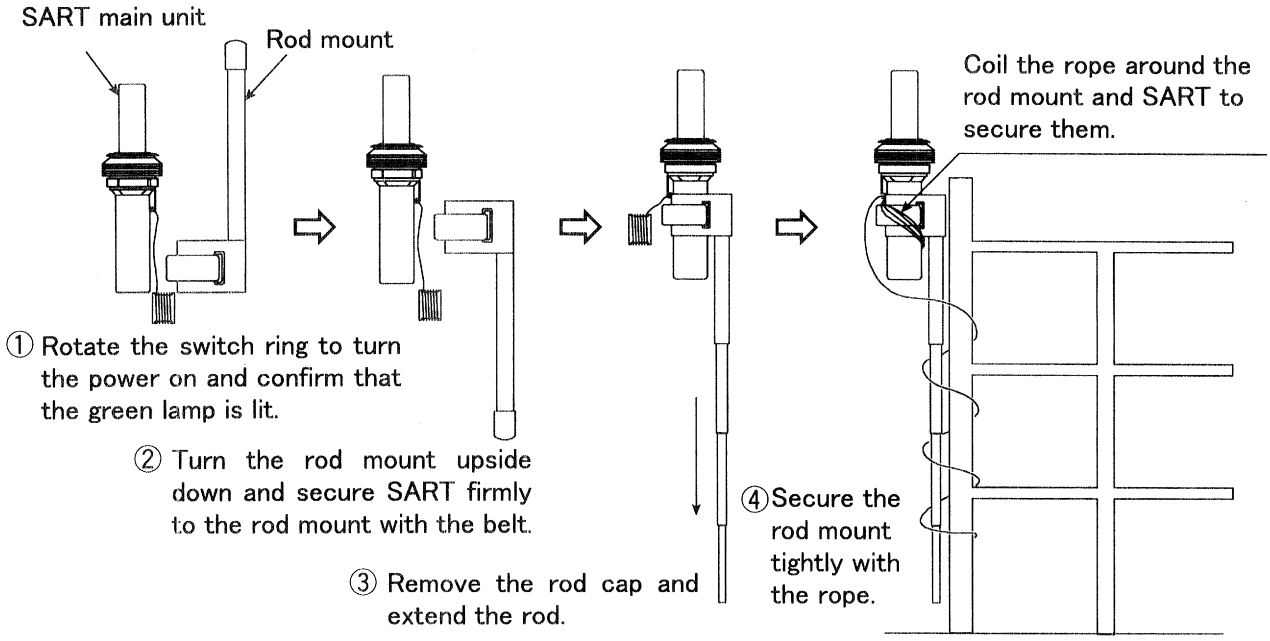


OFF



ON

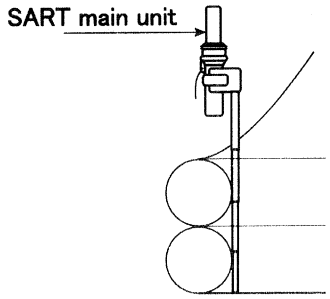
Example (1) Ship Installation shows onboard operation



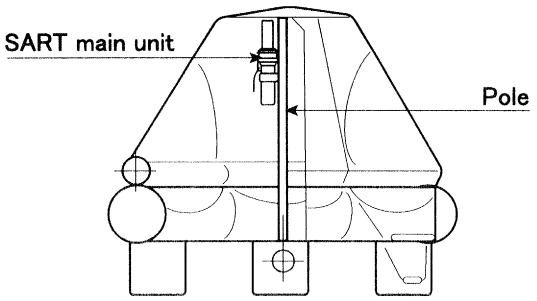
⚠CAUTION

If the rod retracts, firmly re-extend it to ensure unobstructed transmission of radio waves.

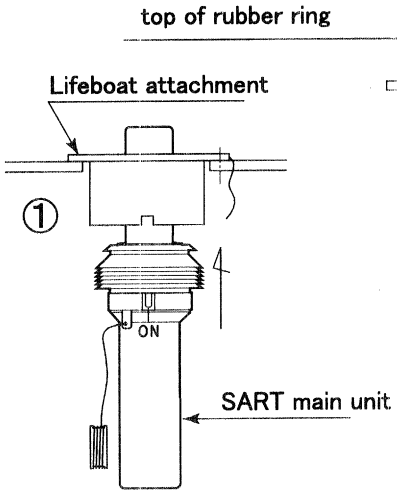
Example (2) Life raft or Life boat Installation



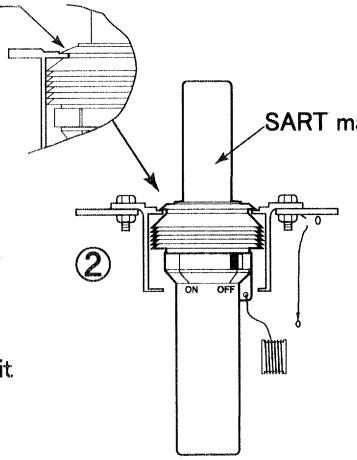
Life raft



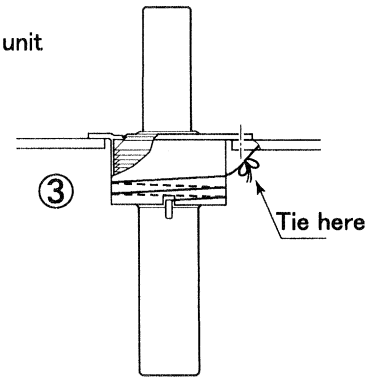
Life raft



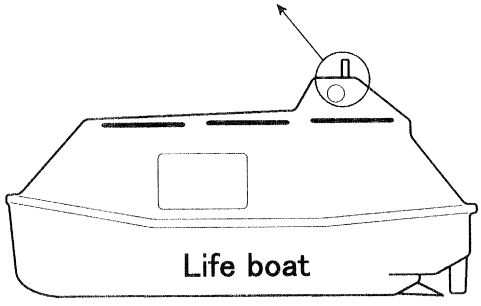
①Rotate the switch ring for power-on. Then insert into lifeboat attachment.



②Push SART into lifeboat attachment till the top of rubber ring overhangs the lifeboat attachment.

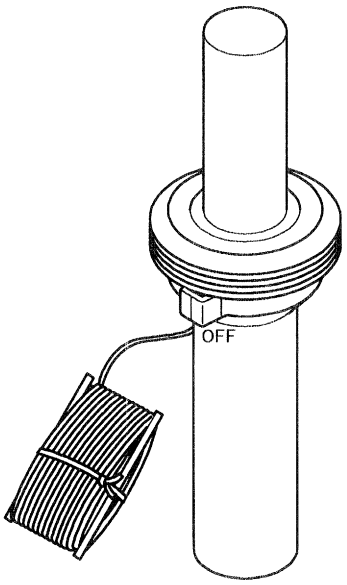


③Wind the rope of SART main unit around the lifeboat attachment. Then tie the rope of SART main unit and the rope of lifeboat attachment.

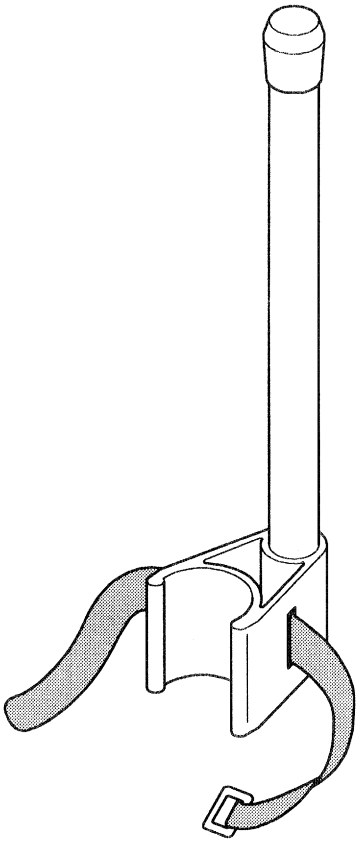


Life boat

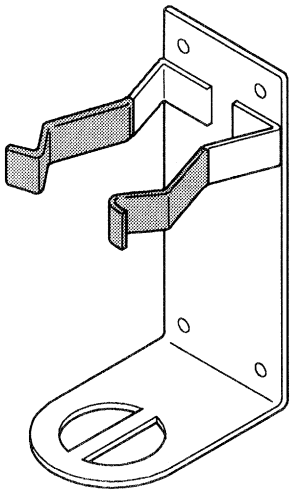
External Views



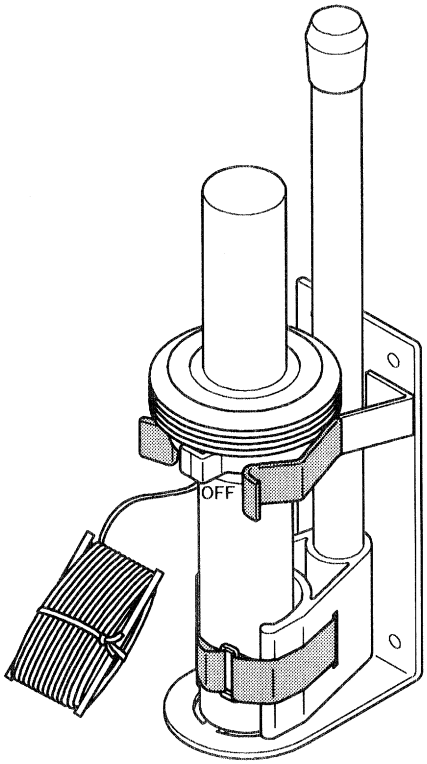
SART Main Unit



Rod Mount



Bracket Mount



SART Storage Illustration

Contents

Glossary

The terminology defined below are frequently used in this manual.

SART	Stands for Search and Rescue Radar Transponder. The name of this equipment.
Socket Holder	Used to stabilize SART when installed on a ship.
Rod Mount	Ensures an unobstructed view of SART and maintains the minimum required 1 m height above the sea level.
Bracket Mount	SART storage device. When not in use, store SART in the Bracket Mount.
Response Radio wave	Transmitted from SART in reply to the radar pulse transmitted by rescue ships or aircraft. This radio wave provides the SART distress position to the rescue operators.
GMDSS	Global Maritime Distress and Safety System.
SOLAS	International Convention for Safety of Life at Sea.

Chapter 1 Introduction

1.1 Function

The JQX-30A is a Search and Rescue Radar Transponder (abbreviated to SART hereafter) which meets the requirements set by SOLAS. SART is a life preserving device approved by GMDSS which is used for locating survivors in the event of a disaster or distress. SART operates in the 9GHz frequency band. When it receives a radar signal (interrogating radio wave) of 9GHz transmitted by a rescue ship or aircraft radar, SART transmits a series of response signals to the searchers to indicate the distress position. The red lamp on SART lights up to inform survivors of the approaching of rescue craft.

1.2 Features

(1) It is portable and operational aboard all ships, life rafts and life boats.

(2) SART comes equipped with a rod mount to secure the antenna at a minimum1 m height above sea level.

(3) To operate SART, remove it from the Bracket Mount and the rotate the switch ring to ON. SART then enters the standby mode.

(4) SART automatically transmits a response signal (the SART code) when a 9GHz radar signal is received during a distress situation. This code indicates the location direction and distance of SART when viewed on the searchers radar display.

(5) When radar signals from rescue ships or aircraft are detected the red lamp on SART lights intermittently. As these signals approach the red lamp light changes from an intermittent light to a continuous light to inform survivors of the proximity of the rescue craft.

(6) SART can transmit a response for more than eight hours continuously after a 96 hour standby.

1.3 Components

No.	Item	Model	Quantity	Remarks
1	Search and Rescue Radar Transponder	JQX-30A	1	
2	Battery	NBB—441	1	Pre-installed in the main unit
3	Rod Mount	332310	1	
4	Bracket Mount	122597	1	
5	Instruction Manual		1	
6	Inspection Data Sheet		1	
7	Life Boat Attachment	MPBP30028	1	Option

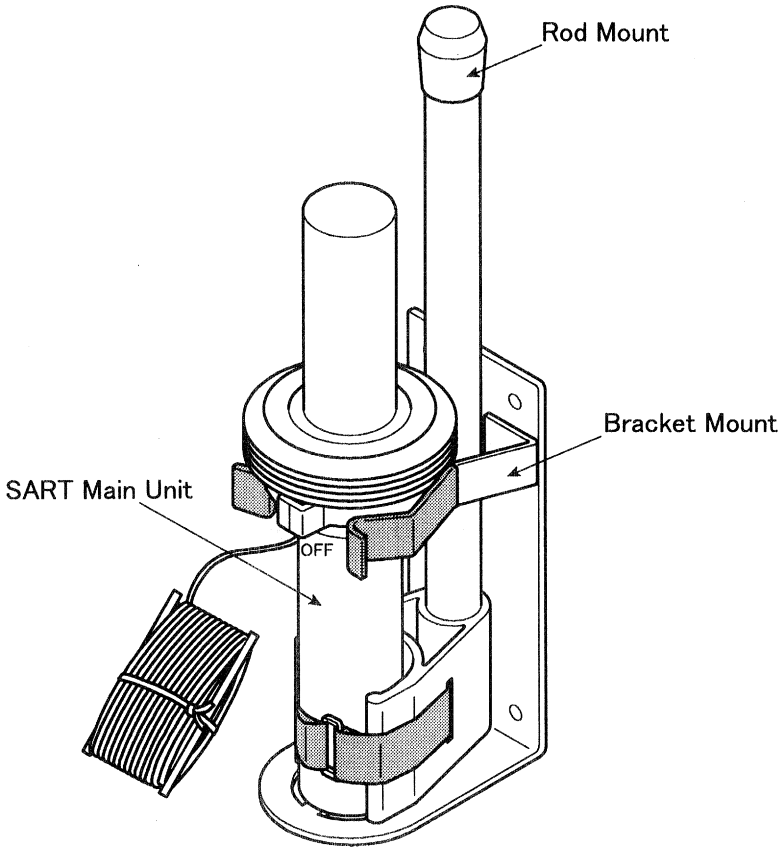


Fig. 1.1 Parts Illustration

1.4 Structure

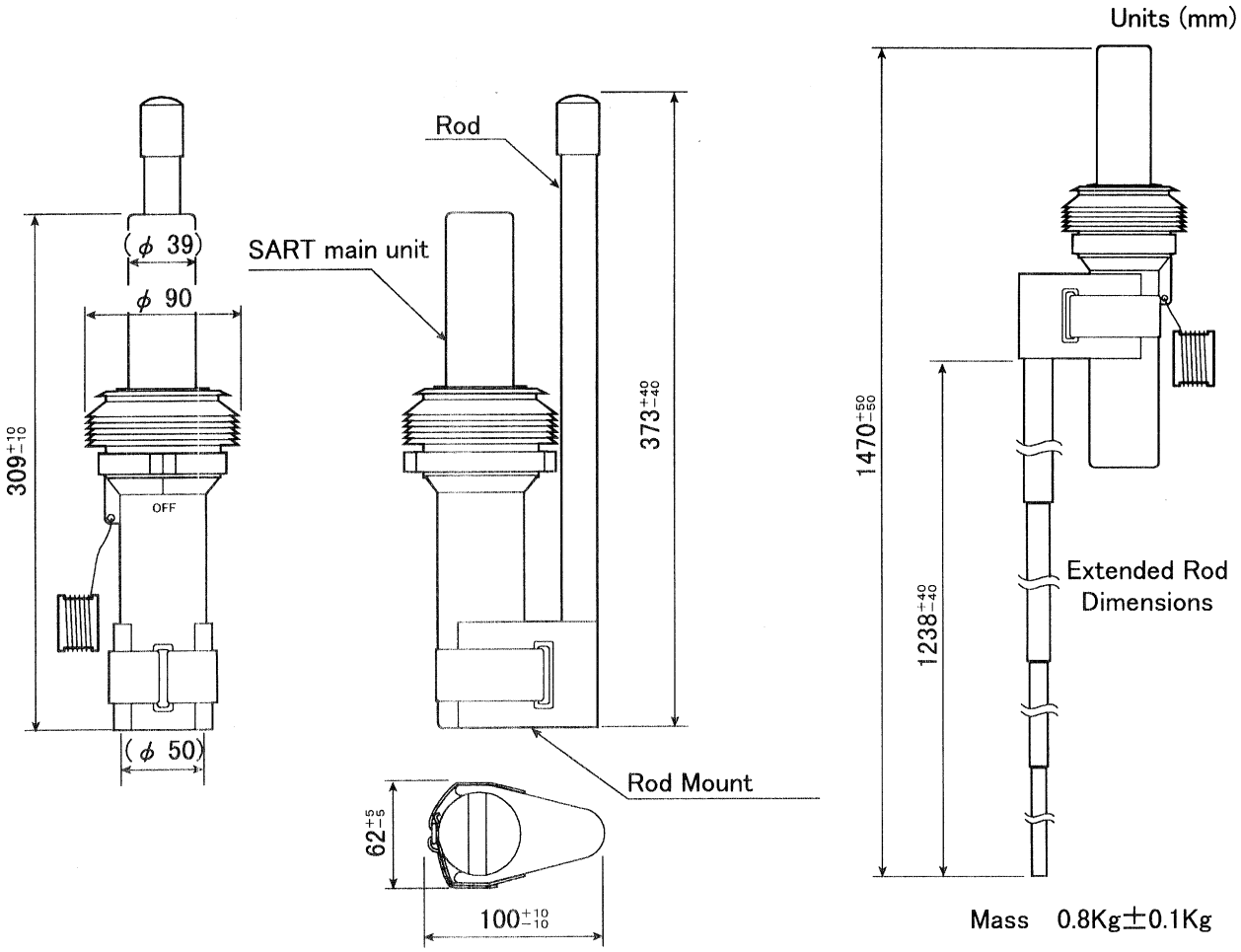


Fig. 1.2 JQX-30A

1.5 Block Diagram

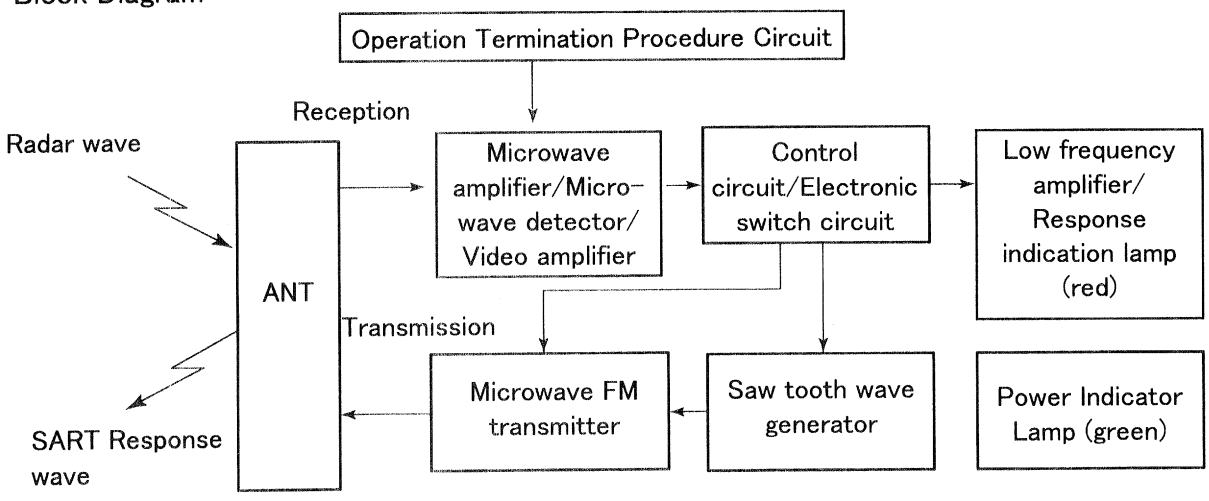
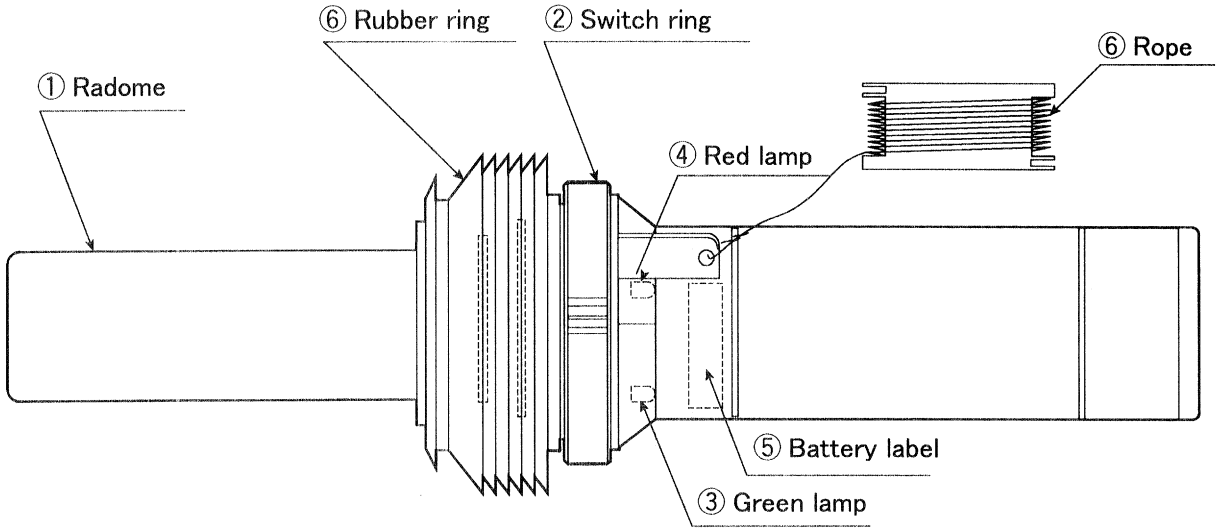


Fig. 1.3 Block Diagram of SART

Chapter 2 Parts and Their Functions



	Part	Function
①	Radome	Houses antenna used to receive radar signals and transmit response signals.
②	Switch ring	Rotating this turns the SART power ON or OFF.
③	Green lamp	Lights up when the power of the SART is turned ON.
④	Red lamp	Lights up intermittently when receiving radar signals.
⑤	Battery label	Displays the battery expiration date.
⑥	Rubber ring	Used to secure SART when installed on a life boat or raft.

Chapter 3 Installation

3.1 Installation Locations

Store SART in the bridge for quick retrieval. During an emergency transfer and install SART in a suitable location on board the ship, life boat or raft. Always remain aware of the storage and emergency installation locations of the SART to ensure rapid retrieval and operation in the event of an emergency.

⚠CAUTION

Do not operate or store the SART in a close proximity to the Radar Antenna (Scanner) as shown in Fig. 3.1. Otherwise, the SART may be exposed to strong radar waves or turn over resulling in SART malfunction.

(1) To store SART first install the Bracket Mount onto a solid wall in the bridge.
Do not store SART in a location where vibration or impact is likely to occur. (Refer to 3.4 Storage)

(2) Store SART in a well-ventilated location away from direct sunlight, wind, rain, sea spray and condensation. Do not store SART outside the ship.

(3) Store SART in a highly visible and easily accessible location.

(4) Inform the entire crew of the SART storage and emergency installation locations.

(5) Store at a distance of more than 1.5m from a magnetic compass.

(6) It is necessary to prepare an installation attachment to secure SART onto a life boat or raft. SART cannot be operated on a life boat or raft without this attachment.

Radar output	A	B	C
5kW～10kW	1.0m	2.0m	5.0m
10kW～25kW	2.0m	3.0m	10.0m
25kW～50kW	2.0m	8.0m	20.0m

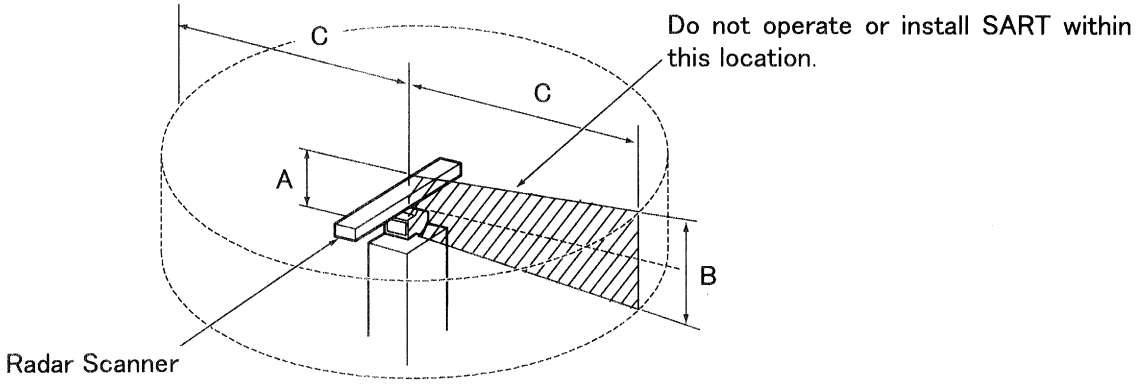


Fig. 3.1 SART Operation Prohibited Area

3.2 Socket Holder Installation

In order to install and operate SART quickly in an emergency it is necessary to have completed preparation of the Socket Holder on the compass deck or other suitable location in advance.

3.2.1 Installation Work

⚠CAUTION

Avoid installing the Socket Holder for SART in the Operation Prohibited Area shown in Fig. 3.1. Installing SART within this area and operating in conjunction with the ship's radar, may result in a malfunction of SART.
Select a location where SART can be easily operated in the event of an emergency.

Paste a label which reads "SART Emergency Installed Location" to mark the installation location clearly. Inform the entire crew of the Socket Holder location in advance. Otherwise, SART will not be installed at the predetermined position, and may not be usable.

(1) Fig. 3.2 shows the shape of Socket Holder. Consult your dockyard engineer regarding installation of the Socket Holder.

(2) Weld the Socket Holder to a hand rail etc. on either side of the compass deck in a location with a good view. Install the Socket Holder so that it is positioned closer to the bow than to the radar mast .(refer to Fig. 3.3)

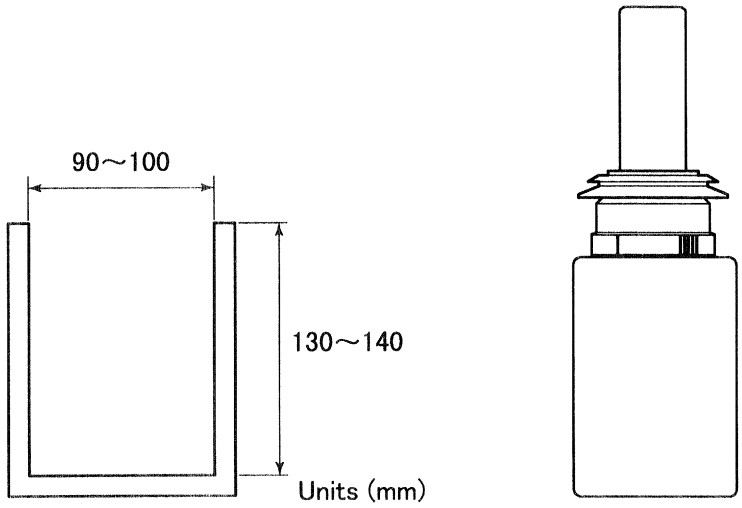


Fig. 3.2 Dimensions of the Socket Holder and Installation Example

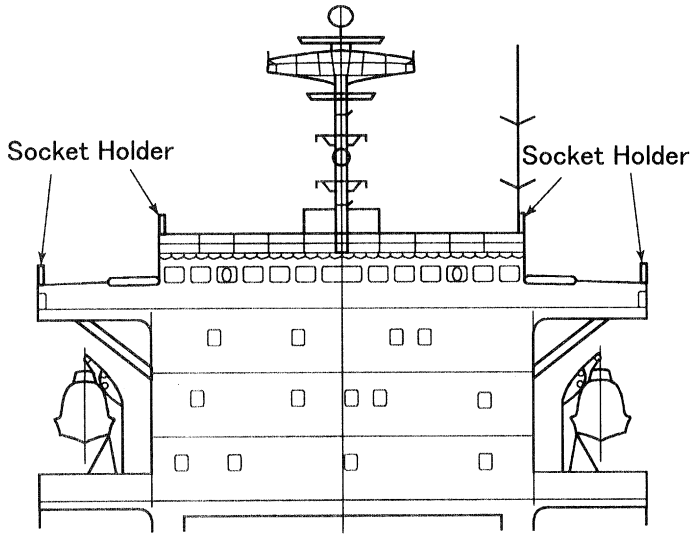


Fig. 3.3 This diagram depicts Socket Holder installation.

3.2.2 Confirmation of Installation Completion

Confirm the following after completing installation.

- That there is no hindrance to the operation of SART.
- That SART is not installed in the Operation Prohibited Area described in Fig. 3.1.

3.3 Life Boat Attachment Installation

To operate SART on a life boat an attachment is necessary to set the antenna in an open place outside the life boat. Refer to the example of the life boat attachment MPBP30028 as shown in Fig. 3.4 below. Follow this example when preparing and installing the life boat attachment.

3.3.1 Installation on a Life Boat

(1) Choose as high a place as possible on the roof of the life boat so that there is no hindrance to the SART installation. (The priority locations are listed in order numbered from ① to ③ in Fig. 3.4.)

⚠CAUTION

Do not install SART at an angle ④. If you do not have any other alternative, install SART with an angle no larger than ±10 degrees from a perpendicular position to sea level. If the above instruction is not observed, reception of radar waves and transmission of emergency signals may be obstructed.

(2) Drill a hole that matches the flange fitting hole size and then install the life boat attachment. (The dimensions of the MPBP30028 are shown in Fig. 3.5.)

(3) Fill the area surrounding the flange with silicon rubber to waterproof it.

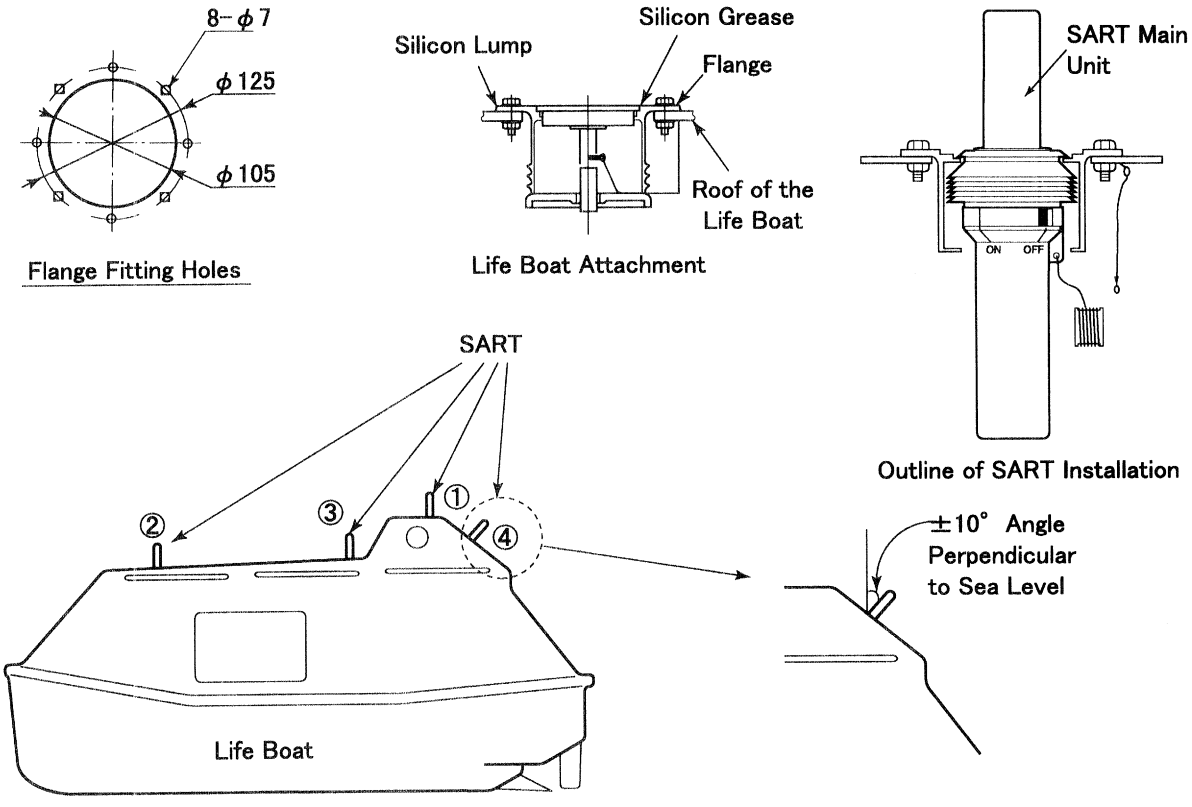
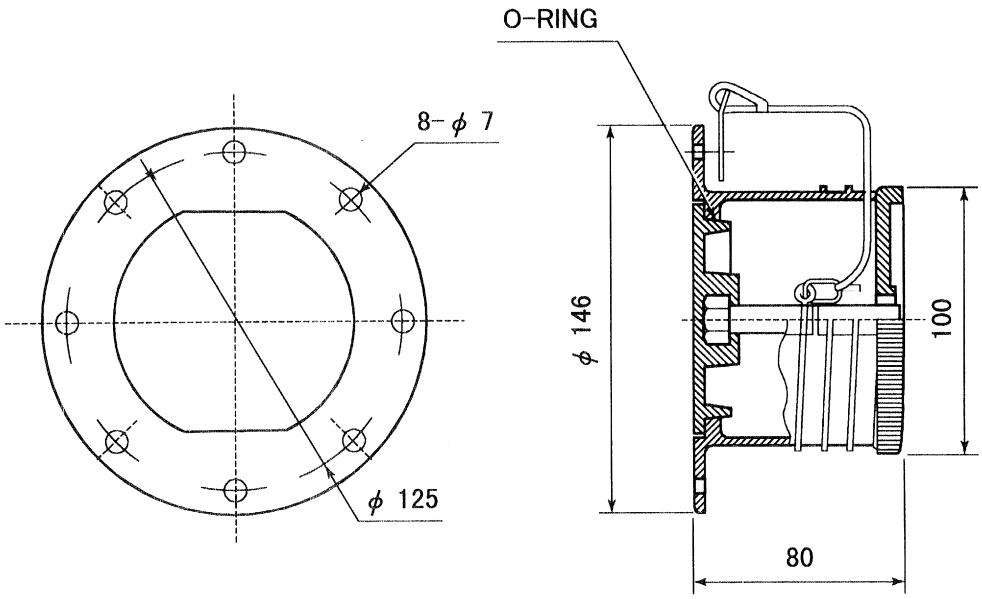


Fig. 3.4 Life Boat Installation



Material : Reny 1501A (Fire proof glass fiber poliamid resin)

Fig. 3.5 Dimensions of life boat attachment MPB30028

3.3.2 Confirmation of Installation Completion

Confirm the following after completing installation.

●That the waterproofing process has been successfully completed.

●That there is no hindrance to SART operation by detaching and re-attaching SART several times.

NOTE: In case of detaching SART main unit from lifeboat attachment, the rubber ring may be come off from SART main unit and be remaining in the lifeboat attachment.

Since not functional fault, put the rubber ring on former position of SART main unit.

3.4 Storage

SART is normally stored in the Bracket Mount which is installed in the bridge.

3.4.1 Bracket Mount Installation

(1) Select a Bracket Mount installation location where there is a wall (wood panel) strong enough to hold the Bracket Mount securely and that is easily accessible in an emergency.

(2) Use 4 wood screws included with SART to install the Bracket Mount (Fig. 3.6) on the wall.

(3) An example of proper storage is shown in Fig. 3.7.

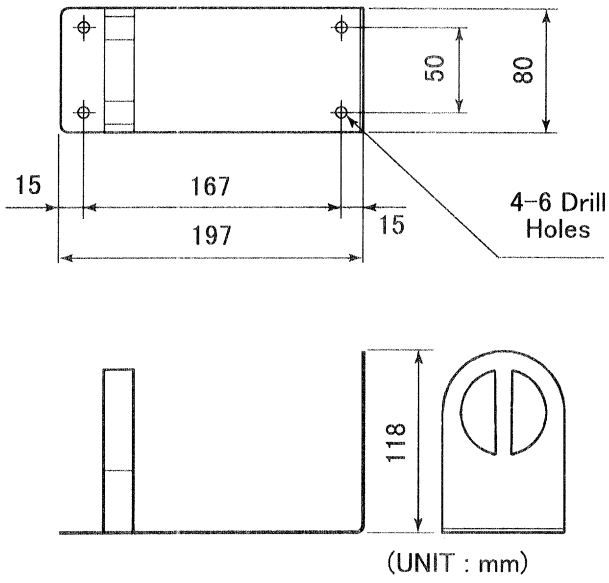


Fig. 3.6 Bracket Mount

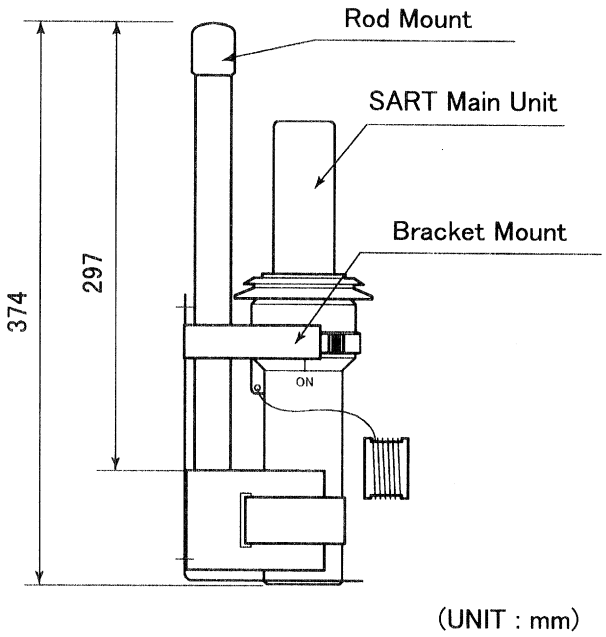


Fig. 3.7 Example of SART Storage

3.4.2 Confirmation of Bracket Mount Installation

Perform the following to confirm that the Bracket Mount is securely installed and functional.

- Confirm that the Bracket Mount is installed securely.
- Confirm that the wall where the Bracket Mount is installed is strong enough and that no vibrations or impacts to SART are likely to occur.
- Confirm that SART is easy to attach and detach from the Bracket Mount by practicing removing and replacing SART several times.
- Confirm that there is sufficient durability for storage in this location.

3.4.3 Attaching SART to the Bracket Mount

⚠CAUTION

Attach SART properly to the Bracket Mount. If SART is not attached properly, the switch ring may be rendered unstable resulting in operation failure.

Attach SART to the Bracket Mount as follows:

(1) Rotate the switch ring so that the mark of the switch ring aligns with the OFF mark.

(2) Confirm that the green lamp is off.

(3) Attach the Rod Mount so that the tip of the Rod points upward, opposite the OFF mark.

(4) Secure the Rod Mount and SART with the Rod Mount belt.

(5) To install SART in the Bracket Mount.

Align the groove on the bottom of SART with the raised groove on the Bracket Mount so that the switch ring is secured by Bracket Mount at the same time.

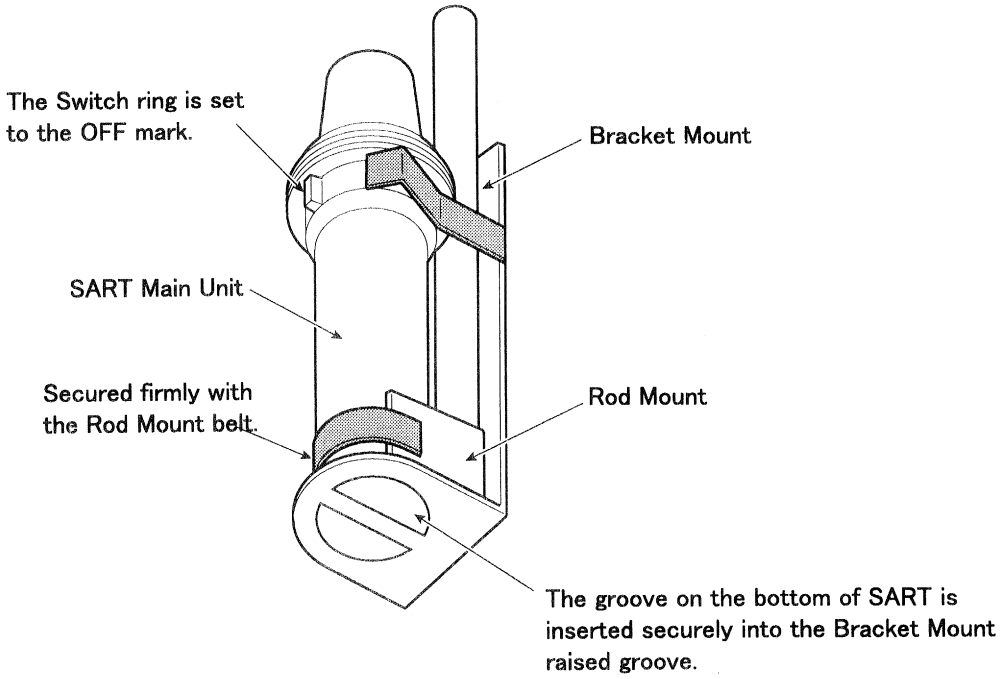


Fig. 3.8 Diagram of SART Installation on the Bracket Mount

Chapter 4 Operation

SART is only to be operated in a sea disaster situation after reporting this emergency situation to any authority or rescue craft.

There are two main types of situations that call for operation of SART.

Situation 1: When a ships propeller malfunctions. In this situation it is not necessary to abandon the ship.

Situation 2: To be operated on a life boat or raft deployed when a ship is abandoned.

In either situation, the following points should be observed into when operating SART.

4.1 Preparation & Inspection Before Operation

⚠CAUTION

Do not use the own ship's radar while operating SART. If the own ship's radar is operating, SART will respond to the own ship's radar and the red lamp will light up. If this happens, it cannot be determined if a Search & Rescue Radar has located SART. Also, using SART in conjunction with the own ship's radar will deplete the SART battery and shorten possible operation time.

Do not install SART in the Operation Prohibited Area shown in Fig. 3.1. Installing in this location and operating in conjunction with the ship's radar, may result in a malfunction of SART.

(1) Install SART in as high a location as possible at a minimum of 1m above sea level. Because radio waves travel farther the higher they are generated, this will improve the probability of contacting a rescue craft.

(2) Install SART in an open area. If SART radio wave transmission is blocked by any part of the life boat or people on it, the radio wave may not reach a rescue craft radar or the rescue crafts radar may not be able to receive the SART position and distance code thus hampering the rescue operation. The Radome contains the antenna which receives and transmits the radio waves, so be extremely careful not to obstruct this part in any way.

(3) Install SART so that the Radome faces upwards perpendicular to the sea surface. The efficiency of SART will be reduced if it is installed at an angle or a tilt of more than ±10°. This will reduce the probability of being located by rescue craft.

(4) Install SART in a location where the red lamp is visible. If SART is located by rescue craft, the red lamp will light up.

(5) After turning the SART power ON, SART will operate for about 96 continuous hours in the stand-by mode.

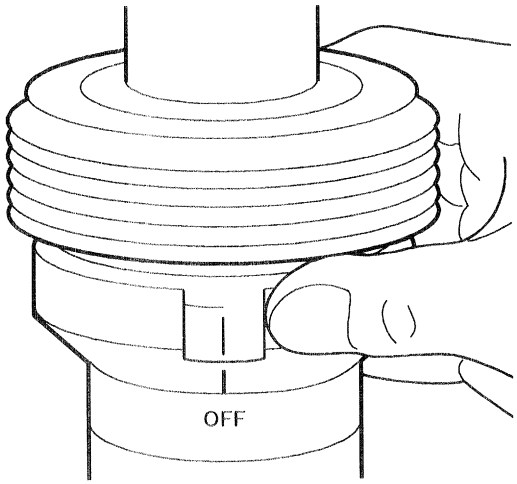
4.2 Operating Procedure

4.2.1 How to Switch the SART Power ON (Refer to Fig. 4.1)

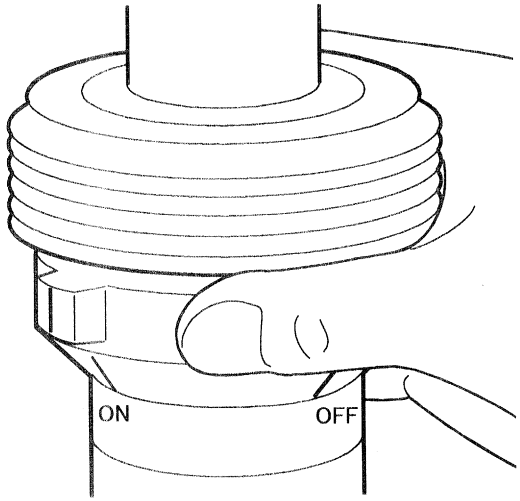
(1) Rotate the switch ring until the switch ring mark aligns with ON to turn on the SART power. Rotate the switch ring until the switch ring mark aligns with OFF to turn off the SART power.

(2) Confirm that the green lamp lights up. This indicates that SART is able to receive radio wave signals. (The stand-by mode). If the green lamp is not lit, SART may be malfunctioning so if this happens please contact our branch office or agency.

(3) The red lamp will light intermittently when a rescue radar signal is received. As the rescue radar approaches, the lamp will change from an intermittent to a continuous light.



Power OFF



Power ON

Fig. 4.1 How to Switch the SART Power ON

4.2.2 Operating SART Onboard a Ship

(1) Switch off the own ship's radar.

(2) Remove SART from the storage location and install it in the SART emergency installation location. (The compass deck or other such location.)

(3) Switch the SART power ON. (Refer to 4.2.1 How to Switch the SART Power ON)

(4) If socket holder is already installed, insert SART with the radome facing upwards into socket holder securely. (Refer to Fig. 3.2 Dimensions of the Socket Holder and Installation Example)

(5) If the socket holder has not been installed or cannot be installed, secure SART firmly with the attached rope to a handrail or other similar location. (Refer to Fig. 4.2)

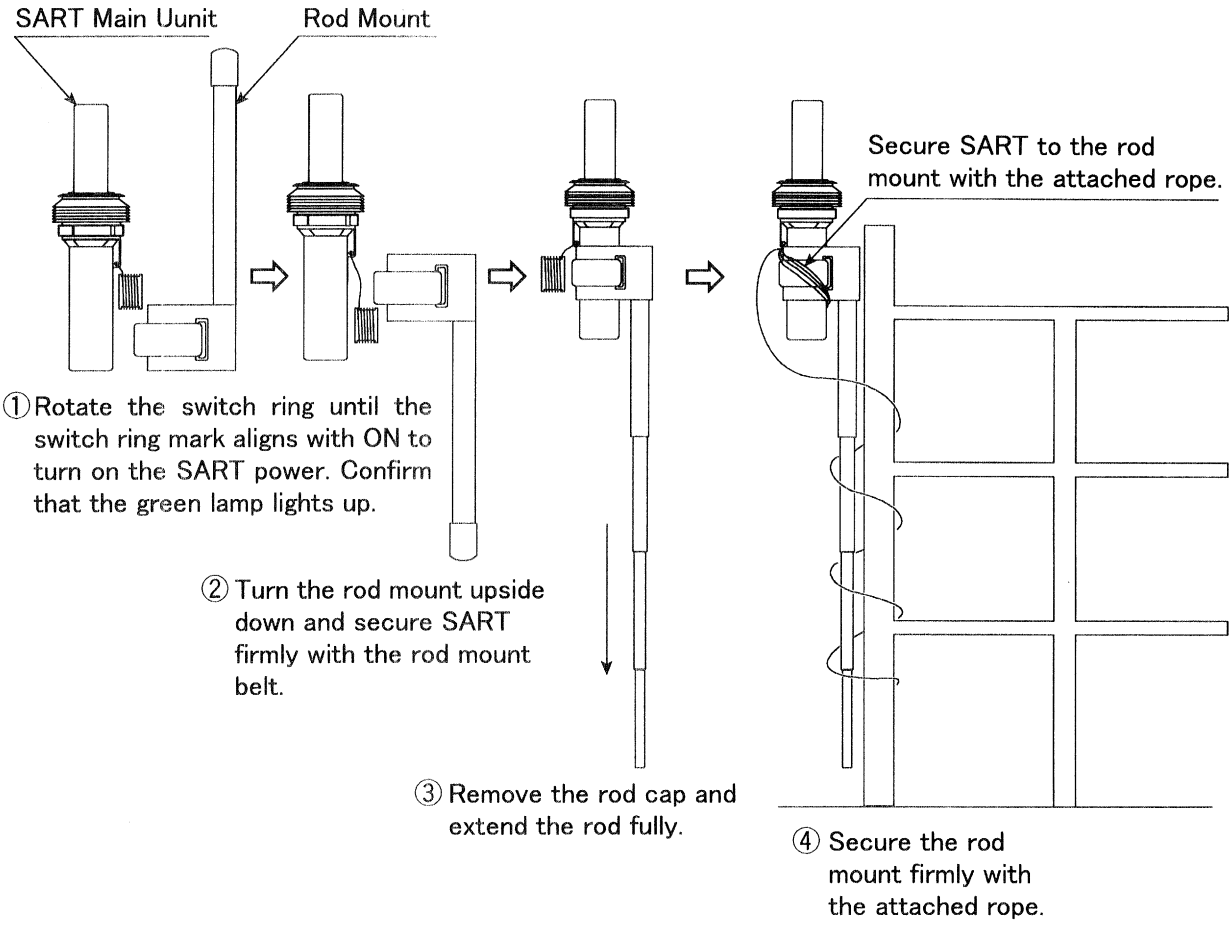


Fig. 4.2 Installation of SART Onboard a Ship with the Rod Mount

⚠CAUTION

If the rod retracts, firmly re-extend it to ensure unobstructed transmission of radio waves.

4.2.3 Installing and Operating SART on a Life Boat

⚠CAUTION

Paste a label which reads "SART Emergency Installation Location" to mark each life boat attachment location clearly, and inform the entire crew of the location of life boat attachments. Otherwise, SART will not be installed at the predetermined position, and may not be usable.

If the life boat has no deck or no life boat attachments, install SART to the mast or on either sides of the life boat referring to "4.2.2. Operating SART Onboard a Ship." If the above instruction is not observed, reception of radar waves and transmission of emergency signals may be obstructed.

(1) Switch off the radar of the own ship.

(2) Remove SART from the storage location and transport it to the life boat.

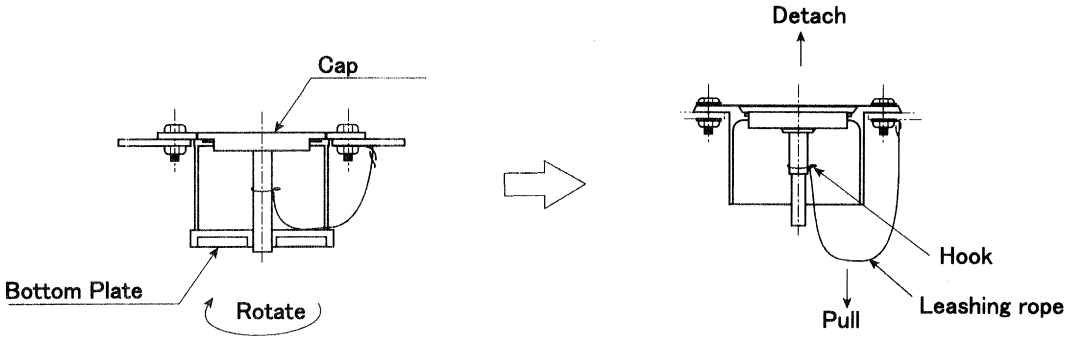
(3) Switch the SART power ON. (Refer to 4.2.1 How to Switch the SART Power ON)

(4) Rotate the bottom plate of the life boat attachment counter-clockwise to detach the plate.

(5) Untie the leashing rope from the hook, pull it downwards and detach the cap.

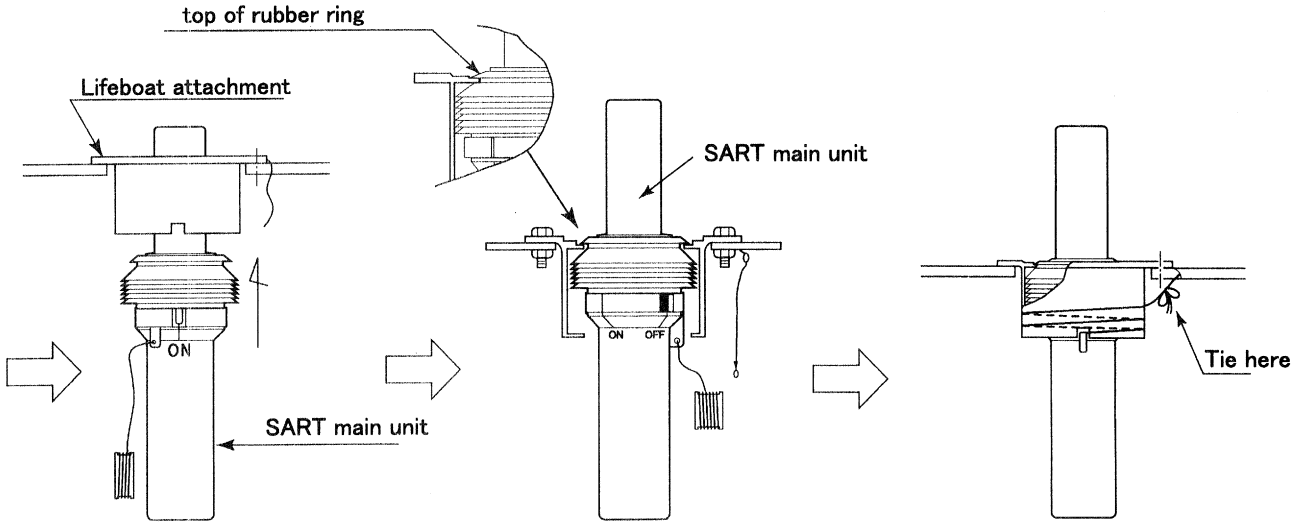
(6) Push SART into lifeboat attachment till the top of rubber ring overhangs the lifeboat attchment.

(7) Wind the rope of SART main unit around the lifeboat attachment.
Then tie the rope of SART main unit and the rope of lifeboat attachment.



①Rotate the bottom plate of the life boat attachment to detach it.

②Pull down on the rope to free it from the hook and detach the cap.



⑤Rotate the switch ring for power-on. Then insert into lifeboat attachment.

④Push SART into lifeboat attachment till the top of rubber ring overhangs the lifeboat attachment.

③Wind the rope of SART main unit around the lifeboat attachment. Then tie the rope of SART main unit and the rope of lifeboat attachment.

Fig. 4.3 Installation of SART on a Life Boat.

4.2.4 Installing and Operating SART on a Life Raft

⚠CAUTION

Select the location for emergency installation of SART on the life raft in advance. Also notify and instruct the entire crew of the SART storage location. Otherwise, SART will not be installed at the predetermined position, and may not be usable.

(1) Switch off the radar of the own ship.

(2) Remove SART from the storage location and transport it to the life raft.

(3) Switch the SART power ON. (Refer to 4.2.1 How to Switch the SART Power ON)

(4) It is ideal to install SART outside on the raft in a location without any obstruction to the radar signals. Select a method similar Fig. 4.4 taking into account the structure of the raft.

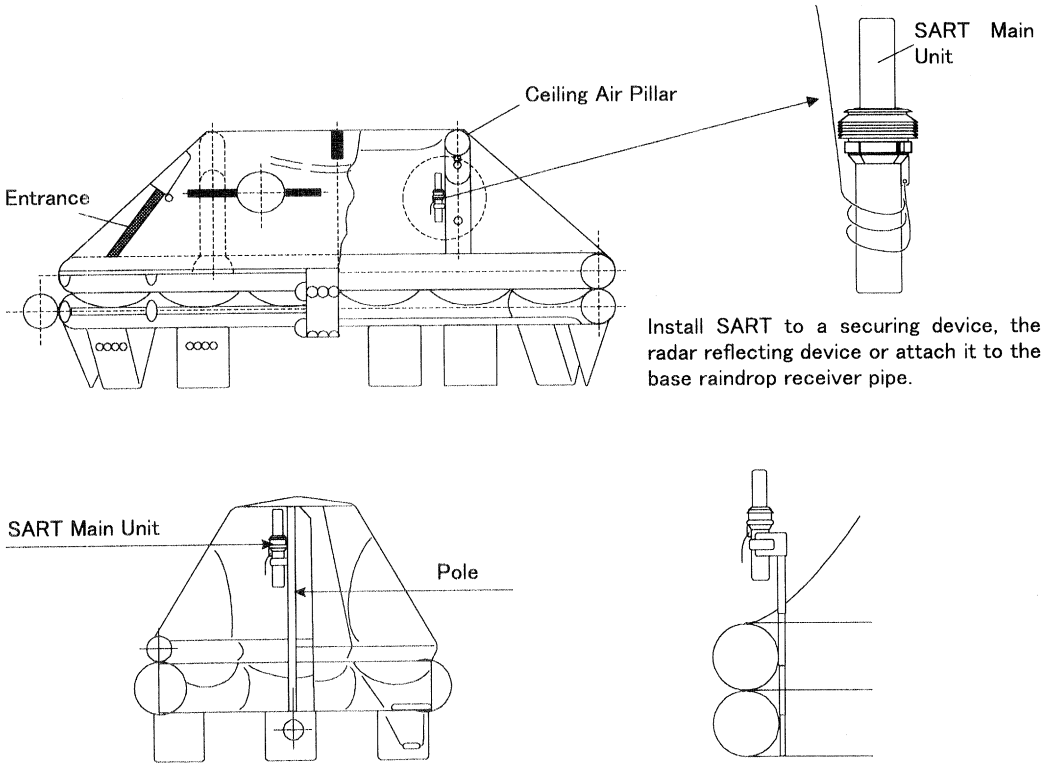


Fig. 4.4 Installation of SART on a life raft.

⚠CAUTION

If the rod retracts, firmly re-extend it to ensure unobstructed transmission of radio waves.

Chapter 5 Operation Description

5.1 Basic Concept of SART Operation

The basic concept of SART operation is shown in Fig. 5.2, and the working principle is explained as follows:

(1) The SART receives radar interrogating pulse signals on any frequency within the band between 9,200 MHz to 9,500 MHz.

(2) The SART transmits a series of 12 frequency swept signals, each covering the range of 9,200 MHz to 9,500 MHz. The forward sweep time will be 7.5μs$\pm$1μs and return sweep time will be 0.4μs$\pm$1μs.

(3) The radar receiver receives the SART's response signals with a pulse width proportional to the receiver intermediate frequency (IF) bandwidth.

(4) The SART response signal is displayed as 12 blips in a bearing direction on the PPI scope of triggering radar. As mentioned in Fig. 5.2, pulse emission time of the SART is 100μs and 1μs of round-trip time corresponds to a distance of 0.081 nautical miles (NM).

0.081 NM/μs $\times$ 100μs = approx. 8NM

The SART swept frequency signals are displayed as a line of 12 blips, and it has 8NM in length on a radar PPI scope.

On the other hand, the length of each blip is converted in range on the PPI scope as follows:

Te =Ts$\times$(Br/F)

=7.5$\times$(10MHz/(9500-9200MHz)) (if Br is 10 MHz)

=0.25μs (equivalent to 0.02 NM)

Br : Bandwidth of radar receiver

F : Sweep frequency range of SART

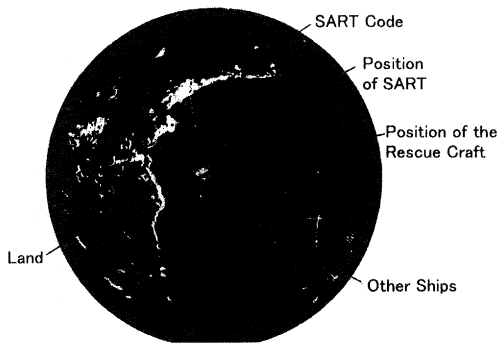


Fig. 5.1 Video Echo of the Radar Indicator.

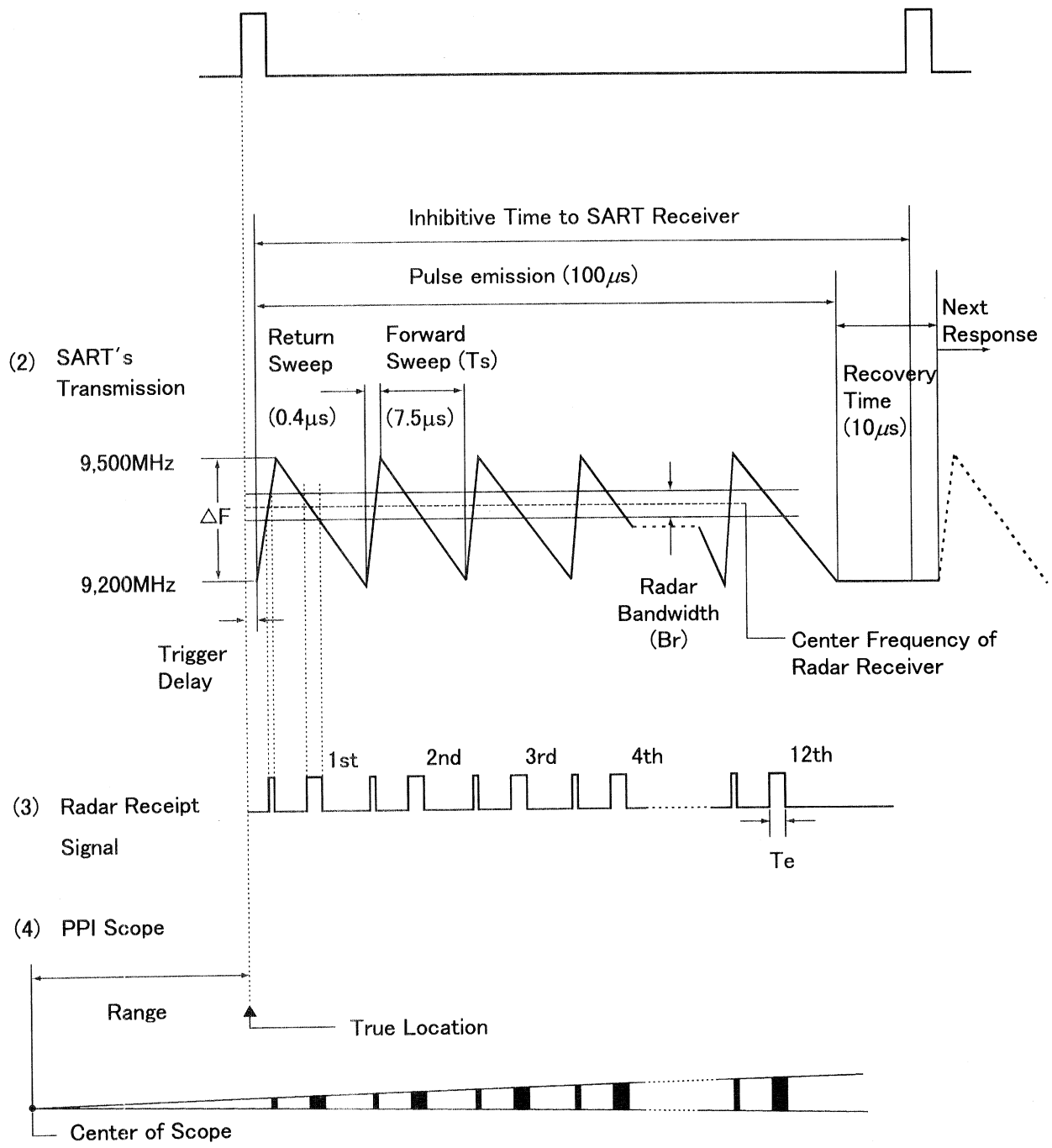


Fig. 5.2 Basic Concept of SART Operation

Chapter 6 Maintenance & Inspection

6.1 Maintenance & Inspection Precautions

It is very important to perform daily maintenance & inspection to ensure correct operation of SART in the event of an emergency. It is recommended to perform this regular maintenance periodically according to the following precautions.

⚠WARNING

Do not attempt to service the interior of this equipment. Only professionals we qualified to service the interior of this equipment. Self-service may result in fire or malfunction. Contact our branch office or agency for service.

⚠CAUTION

If you suspect there is a malfunction, please contact our branch office or agency to get it repair or rebuild the SART immediately.

Do not use any solvents cleaning SART. Otherwise, the painting on the waterproof outer cover or case may be damaged.

Confirm "EXPIRY DATE" column of the SART surface whether battery is effective or not.
Battery is effective for 3 year after the new installation or 3 year from former battery replacement day.
For battery replacement, order JRC branch office or agent.

The battery used in this device is a primary battery and are not rechargeable.
Attempting to recharge the battery may result in an explosion.

6.2 Daily Maintenance (Performed by the crew on the ship)

6.2.1 Inspection

At least once a week, inspect SART by referring the points below and record the inspection results in the inspection check list located in Table 6.1. If a malfunction is detected during inspection it must be dealt with immediately. (Refer to 6.2.2 Troubleshooting Checklist)

(1) Inspection Location : Cabins such as the bridge.

(2) Inspector : A crew member nominated by the captain.

(3) Inspection Interval : Once a week.

(4) Inspection Equipment : Visual inspection.

(5) Inspection Points :
- Scratches, dirt or damage on the outer cover.
- The green lamp does not light up.
- Battery expiration date. Confirm that the " EXPIRY DATE" on the label has not expired.
- Confirm that there is no obstruction nearby that would inhibit the removal of SART in an emergency.

6.2.2 Troubleshooting Checklist

Inspection results (Abnormal or defective items)	Action
The label is damaged or small scratches are visible on the outer cover.	Contact the nearest branch office or agency.
Dirty	Clean it with dry cloth.
There is a remarkable change in color, a crack or other such damage on the outer case.	Request the branch office or agency to replace SART.
The green lamp lights up when the power switch is OFF.	Request the branch office or agency to replace or repair SART.
The battery has expired.	Request the branch office or agency to replace the battery.

Table 6.1 Inspection Checklist

Inspection date (month / day / year)	Outer Cover Visual Inspection	Green Lamp Condition	Battery Expiration Date Check	Inspector

Chapter 7　After-sale Service

When to request repair service.

If anything is wrong, stop using SART immediately and then contact our agency.

- **Repair service within the warranty term.**

  If the unit has been used under normal conditions while following all the manual instructions correctly, our branch office or our agency will repair SART for free, should it malfunction. However, if the defect is the result of misuse, neglect, a natural calamity or fire, the repair service will be charged.

- **Repair service after the warranty expiration.**

  If it's possible to repair the unit in the event of a malfunction, our agency will repair SART by customer request. (Service fee is charged).

- **Items necessary need to be reported**

  ☆Product name, Type, Date of production, Lot number.

  ☆Malfunction Information (as detailed as possible).

  ☆Company or organization name, address and phone number.

Recommended Inspection and Maintenance.

We recommend regular inspection and maintenance by serviceman in addition to the daily maintenance performed by the crew.

Contact our branch office or agency to receive this service.

(Service will be changed)

If you have any questions regarding after-sale service, please contact our branch office or agency.

To find the branch office or agency nearest you, refer to the address list in the back of this manual.

Chapter 8 Disposal

⚠WARNING

When disposing of used or expired lithium batteries, insulate with tape on each terminal.
Failure to do so may result in a short, explosion or fire.

8.1 Equipment Disposal

●Observe local government rules and regulations when disposing of this equipment.

8.2 Used Battery Disposal

A lithimum manganese dioxide battery is used in this equipment.

●Return all used batteries to the nearest branch office or agency. A service fee is charged for disposal of used batteries.

●Insulate the used battery with tape on each terminal.

●For further information regarding battery disposal, contact our branch office or agency. Refer to the "Information Center List" in the back of this manual.

Chapter 9 Specifications

9.1 Electrical Specification

(1) Signal

frequency	:	9,200MHz+0/−60MHz～9,500MHz+60/−0MHz
Plane of polarization	:	Horizontal

(2) Antenna

Perpendicular surface beam width	:	±12.5°
Horizontal surface	:	Non directional
	:	It can be made higher than 1m from the sea surface by using Rod Mount.

(3) Receiver

Effective reception sensitivity (ERS)	:	Less than −50dBm
Recovery time	:	Less than 10μs

(4) Transmitter

Modulation	:	QON(Pulse Modulation)
Modulation wave shape (Sweep wave shape)	:	Saw tooth wave
Forward sweep time	:	7.5±1.0μs
Return sweep time	:	0.4±0.1μs
Number of sweep /time	:	12 times.
Transmitting electric power (EIPP)	:	400mW(+26dBw) or more
Trigger delay	:	0.5μs or less

(5) Battery

Type	:	Lithium Manganese dioxide Battery (primary)
Model	:	NBB-441
Capacity	:	More than 8 hour continuous operation after 96 hour standby mode (with power on) Nominal Voltage 6V Capacity 10AH
Period of validity	:	shown on the body

9.2 Mechanical Specification

(1) Environmental condition

Operating temperature range	:	-20℃ to +55℃
Humidity	:	90 % , 40℃
Storing temperature range	:	-30℃ to +65℃

(2) Dimensions & Weight

SART main unit	:	Diameter 90mm×Length 309mm
		Weight about 580g
With Rod mount attached (storing condition) :		
		Height 373mm×Width 88mm×Depth 100mm
		Weight about 800g
Bracket Mount	:	Height 197mm×Width 80mm×Depth 118mm
		Weight about 440g

MEMO

MEMO

JRC Japan Radio Co., Ltd.

电子信息产品有害物资申明
日本无线株式会社

Declaration on toxic & hazardous substances or elements
of Electronic Information Products
Japan Radio Company Limited

有毒有害物质或元素的名称及含量
(Names & Content of toxic and hazardous substances or elements)

形式名(Type): JQX-30A　　名称(Name): SART Radar Transponder

部件名称 (Part name)	有毒有害物质或元素 (Toxic and Hazardous Substances and Elements)					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr^{6+})	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
主要装置 (Main Unit)	×	×	○	×	×	×
外部设备(Peripherals) ・选择(Options) ・手册(Documennts)	×	×	○	×	×	×

○:表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11306-2006 标准规定的限量要求以下。
(Indicates that this toxic, or hazardous substance contained in all of the homogeneous materials for this part is below the requirement in SJ/T11363-2006.)

×:表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006 标准规定的限量要求。
(Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T 11363-2006.)

JRC Code No. : 7ZPKD0004A

RE: 中华人民共和国电子信息产品污染控制管理办法
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