

VHF Marine Radio

RT-1050

RT-1050 AIS

User Manual

NAVICOM



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RT1050/ RT1050-AIS User Manual

RF Radiation Information

RF Radiation Profile

Your radio is designed and tested to comply with a number of national and international standards and guidelines (listed below) regarding human exposure to radio frequency electromagnetic energy. This radio complies with the IEEE and ICNIRP exposure limits for occupational/controlled RF exposure environment at operating duty factors of up to 50% transmitting. In terms of measuring RF energy for compliance with the FCC exposure guidelines, your radio radiates measurable RF energy only while it is transmitting (during talking in PTT mode), not when it is receiving (listening) or in standby mode. The device complies with SAR and/or RF field strength limits of RSS-102 requirement.

RF Radiation Safety

In order to ensure user health, experts from relevant industries including science, engineering, medicine and health work with international organizations to develop standards for safe exposure to RF radiation. These standards consist of:

- United States Federal Communications Commission, Code of Federal Regulations; 47 CFR part 2 sub-part J;
- American National Standards Institute (ANSI)/Institute of Electrical and Electronic Engineers (IEEE) C95.1-1992;
- Institute of Electrical and Electronic Engineers (IEEE) C95.1-1999;
- International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1998;

FCC Regulations

Federal Communication Commission (FCC) requires that all radio communication products should meet the requirements set forth in the above standards before they can be marketed in the U.S, and the manufacturer SHALL

post a RF label on the product to inform users of operational instructions, so as to enhance their occupational health against exposure to RF energy.

Part 15 Compliance

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help. Note: "Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment."

EU Regulatory Conformance

As certified by the qualified laboratory, the product is in compliance with the essential requirements and other relevant provisions of the Directive 2014/53/EU. Please note that the above information is applicable to EU countries only.

Warning - Limitations on Use

This RT1050AIS product contains simple PPI chart, only as an aid to navigation for reference. Only Official Government Charts and Notice to Mariners contain all the current information needed for safe navigation. This products feature cannot be relied on as complete or accurate and may vary depending on location. It' s the captain' s responsibility to use official government charts, notices to mariners, caution, sound judgment and proper navigational skills when operating their boat using this product.

Manufacturer: HIMUNICATION

Trademark number: 11005103

Address: 3rd Floor,Block C,Huafeng Second Industry Park, Hangcheng Road, Gushu, Xixiang town, Baoan District, Shenzhen, China

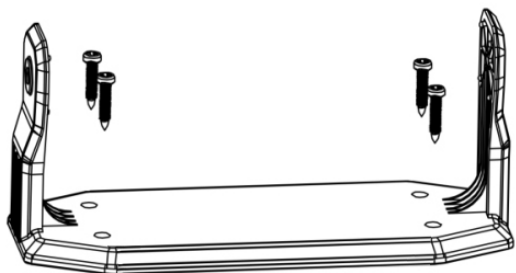
Importateur: NAVICOM

Numbel: SIRET 31812243900058

Adresse: 32 Rue Marcel Paul – ZA de Kerdroniou – 29000 Quimper

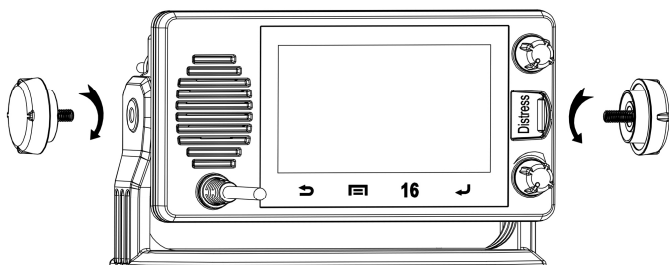
1. Installation

Yoke Mount Installation:



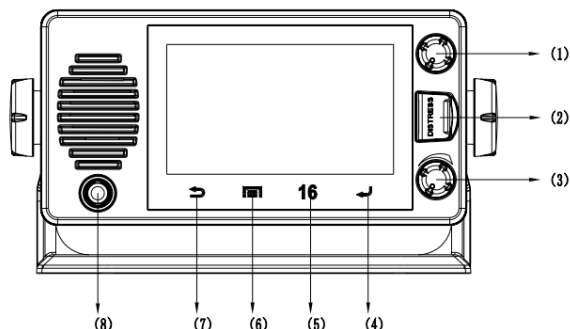
1. Place and fasten the mounting bracket on the console by 4 screws;
2. Mount the radio onto the bracket;
3. Attach the supplied mounting knobs from two sides of the bracket to fix the base radio securely in the mounting bracket (as shown above).

Note. Mounting bracket, mounting knobs and 4 screws M4x20 are in a radio's package.



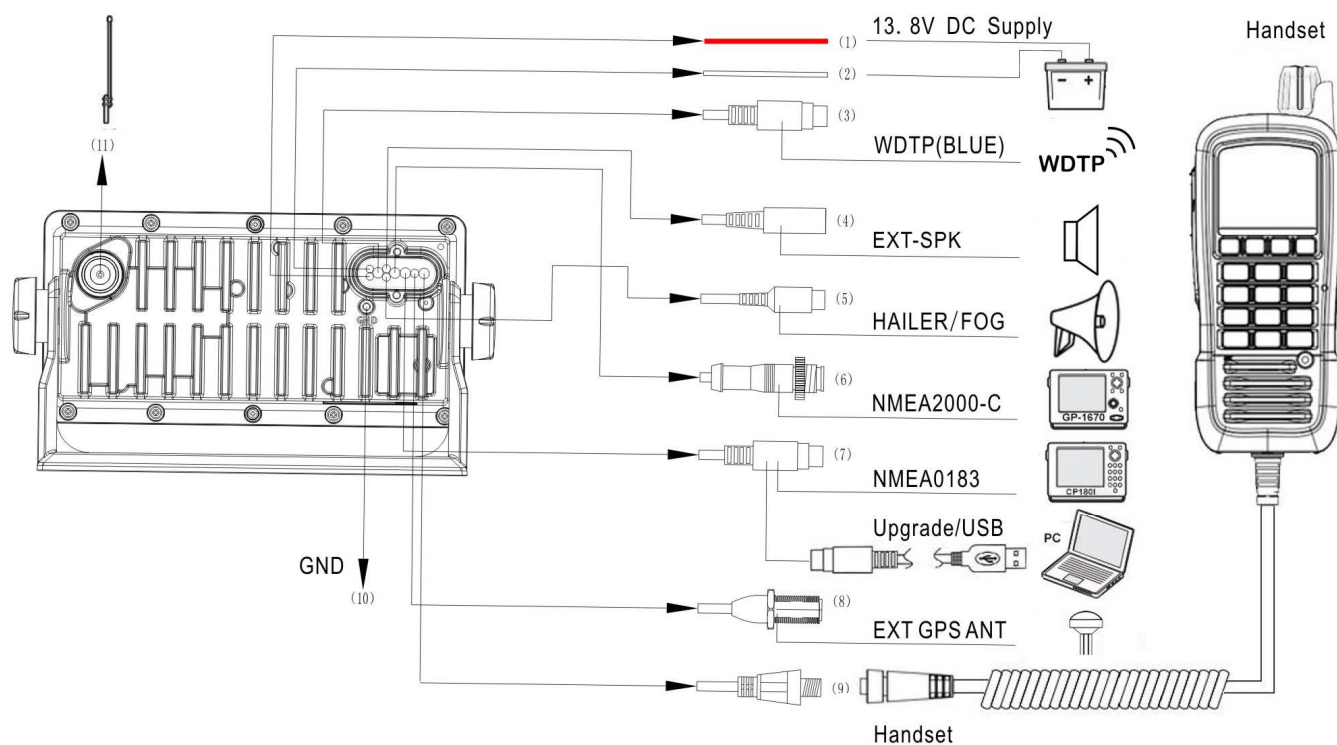
2. Front Panel/Back Panel

Front Panel



1. SQL Knob—The SQL will becomes larger while Turning rotary knob by clockwise and vice versa.
2. DISTRESS key—Pull up key cover and press hold on to start Distress Alert Calling if you programmed your radio with an MMSI Number.
3. VOL Knob—When the radio is off, turn rotary knob by clockwise then radio power on and vice versa. Cotinue to rotate knob to get up/down function when radio is on.
4. Enter key—Any time,press this to enter.
5. 16 key—Any time,press this to channel 16.
6. Homepage key—Any time,press this to homepage.
7. Return key—Any time,press this to return to previous level.
8. Standard Handset PTT—remote command microphone push this key to sent out radio frequency signals.

Back Panel



- 1、 Power + wire (red, 210 mm length)
- 2、 Power – wire (black, 210 mm length)
- 3、 WDTP (BLUE)
- 4、 External speaker cable with 3.5 mm plug (180 mm length)
- 5、 Hailer/Fog cable with 3.5 mm plug (180 mm length)
- 6、 NMEA 2000 cable (180 mm length)
- 7、 NMEA 0183 cable/upgrade USB (180 mm length)
- 8、 EXT GPS ANT
- 9、 The second handset (Optional)
- 10、 GND hole (M3x5)
- 11、 RF antenna port SMA (Female)

As above show, the “number in picture” correspond to “wiring number” also correspond to “the number in the below table” The details please check the below table.

Connection cables The details please check the below table

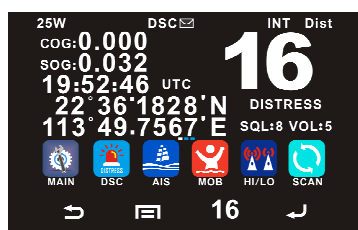
Serial Number	General Description	Function Description	Different Color Code of the cable wires	
(1)	Red & Black Power	Power supply wires	Red	Power+ +13.8V
(2)			Black	Power- GND
(3)	WDTP (BLUE) connector	WDTP (BLUE)	-	-
(4)	Audio Connector Black 3.5 mm Plug	External Speaker	Red	AUDIO-OUT
			Black	GND
			-	NC
(5)	Audio Connector RCA (Phone) Plug	Hailer/Fog	White	SPK+
			Black	SPK-
(6)	NMEA 2000 connector	NMEA2000 network	-	-
(7)	NMEA 0183 connector	NMEA0183 network Software upgrade	Green	USB-TX
			Brown	0183_OUT
			White	NC
			Orange	0183_IN
			Red	USB-RX
			BARE WIRE	GND
			Black	GND
(8)	EXT GPS ANT connector	EXT GPS ANT	-	-
(9)	Remote command microphone connector (Optional)	Remote command microphone (Optional)	-	-
(10)	GND connection hole	Grounding ware	-	-
(11)	RF antenna connector SMA (Female)	VHF antenna	-	-

Connection cables in a package box

NMEA0183 connection cable, 0.4 m length (depending on a model)

Hailer cable, 0.4 m length

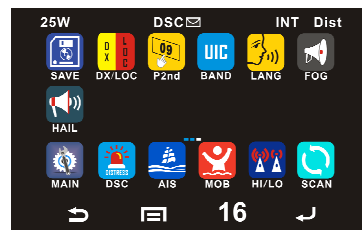
3. LCD Display



Homepage 1



Homepage 2



Homepage 3

There are three homepages, you can swipe left or right to switch homepages.

The bottom row is the shortcut. If you want to relocate the icon, hold on the icon and drag it to the blank area to release it.

4. Function key



Any time, press this to return to previous step.



Any time, press this to homepage.



Any time, press this to channel 16.



Any time, press this to enter.



CHAN

Click the "CHAN" icon to select channel, you can click slide to left or click "◀" page up, slide to right, or click "▶" to page down. Select the desired channel and return to normal mode.



SCAN

Click the "SCAN" icon to enter scan interface.

5. ICON Function



GPS

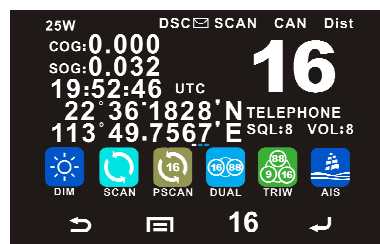
Click the "GPS" icon to check current position when connecting antenna.



HI/LO

Click the "HI/LO" to toggle the TX power from Hi to Lo and vice versa. The corresponding "25W/1W" icon will be displayed on the LCD.

Some of the channels (such as channel 16 initially set for high power channel 13&67 initially set for low power) have been initially set to be low power or high power, but can be reprogrammed manually to high power or low power.



Click "Start" to activate the scan function which is searching for currently all working channels. All scanning: CH1-CH2-CH3-...-CH88. Memory scanning: M1 - M2 - M3 - ...M10 - M1- ...

When a signal is detected, the scan pauses until the signal disappears.

If you want to stop, click "Stop".



PSCAN

Click the "PSCAN" icon to enter Pscan interface.

Click "Start" to activate the Priority Scan.

Priority memory scanning: M1 – CH 16 – M2 – CH 16 - ...
CH 16 – M1...

Priority all scanning: CH1-CH16-CH2-CH16-CH3-
CH16-...CH88-CH16-L1-CH16-



DUAL

At the normal mode, Click the "DUAL" icon to enter dual interface.

Click "Start" to activate the DUAL WATCH mode. Monitor the current channel and CH16 in cycle. Whenever weather alert is activated, the WX Alert channel will be monitored once every 4 seconds.



TRIW

Click the "TRIW" icon to enter triw interface.

Click "Start" to activate the TRI WATCH mode. Monitor CH16, current channel and one programmed channels in cycle.



MOB

Click the "MOB" icon, "MOB" icon will be shown on LCD, then Press Distress for 3 seconds, Distress call with nature MOB is sent.

MOB mark is outputted via NMEA. A MOB mark is immediately sent to the chart plotter to have a position as accurate as possible.



HAIL

Click the "HAIL" icon to enter "HAILER LISTEN MODE" for setup as you wish. Sounds received through the horn can be heard through the radio speaker. Press and hold the PTT key and speak your announcement. Release the PTT key to listen.



FOG

Click the "FOG" and enter "Foghorn Menu", then select preferred item from list. Press PTT key on the microphone or handset to sound the horn. The horn will stop when you release the PTT key in Manual Mode .



MEM

Enter /Exit the memory mode:

Click the "MEM" icon to enter the memory mode, the memory channel will be marked and "M" icon show on the right side next to channel number. At the left side of the current channel will mark a "MEM" icon which means already entered the user memory mode.

At the Memory mode, short press the MEM key to exit the memory mode. The "M" icon and "MEM" icon will disappear.



SAVE

Adding/Deleting memory CH:

1. At the normal mode, select desired channel for programming.
2. Click the "SAVE" icon to store up the channel as memory channel.
3. "M" icon will be shown on LCD to indicate the current CH has been saved in the memory.
4. No limitation for saving memory channels.
5. For USA, International, and Canadian Frequency can be saved separately.
6. At the normal mode, select the memory channel to be deleted.
7. Click the "SAVE" icon to delete the selected channel from the memory mode.



Click the “DX/LOC” to get conversion between local and distance mode (DX allows normal receive sensitivity; and “LOCAL” eliminates receiver noise, but degrades receiver sensitivity meanwhile “LOCAL” icon display on LCD).



At the normal mode, Click the “16” to jump to priority CH16 at High Power if the current channel is not the priority channel.
After the channel is tuned to priority CH16, “P” icon is lit to indicate the priority CH16 has been reached. Slide the channel to left or right to return to normal mode.



At the normal mode, Click the “CH09” to jump to second priority channel(Default CH09) at High Power if the current channel is not the priority channel.
After the channel is tuned to second priority channel, “P2nd” icon is lit to indicate the second priority channel has been reached. Slide the channel to left or right to return to normal mode.



Click the “P2nd” ,all channels will be display on the screen,you can click slide to left or click “◀” page up,slide to right,or click “▶” to page down.Select the desired channel as second priority channel, and return to normal mode.



Click the “NIGHT” icon to switch between night mode and day mode.



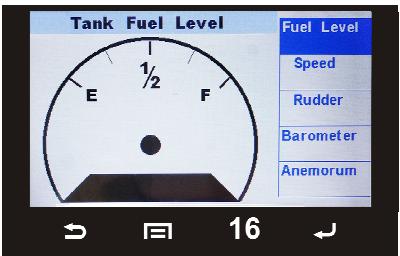
Night mode



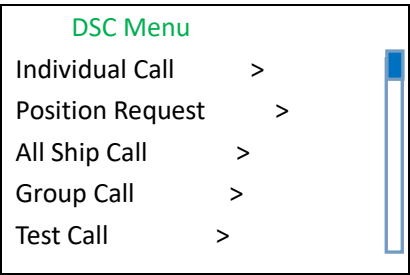
Day mode



Click the “DASH” icon to enter dash board.You can see the instrument panels.
Connect the N2K line.If there is data input from N2K interface line,you can click the icon to display the panel.



Click the “DSC”, the DSC Menu will be displayed as below on LCD:



Detailed entrance for each catalogue as shown below:

Individual Call▶▶	Individual Call
	Input Address
	From Phone book
Position Request▶▶	Position Request
	Input Address
	From Phone book
All Ship Call▶▶	All Ship Call
	Safety
	Urgency
Group Call▶▶	Group Call
	Input Address
	From Phone book
Test Call▶▶	Test Call
	Input Address
	From Phone book

Receive Call Log▶▶	Receive Call Log
	☎ Distress Call
	☎ Others Call
Send Call Log▶▶	Send Call Log
	☎ Distress Call
	☎ MOB Call
	☎ Others Call
Phone Book▶▶	Phone Book
	Buddy List
	Group List
DSC Setup▶▶	DSC Setup
	Position Input
	Position Reply
	Test Ack
My MMSI ID▶▶	My MMSI ID
	100000008

MY MMSI ID setup

Firstly, press MAIN icon to enter “Main Menu”.

Secondly, click to select “DSC Operation” to enter “MY MMSI ID”.

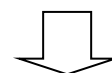
Then you can set up your related MMSI ID as below, generally you need to double confirm the MMSI ID. Once confirmed, your MMSI ID will be locked by this radio.

My MMSI ID
123456789

When input 9 digits, click the number on the soft keyboard for choosing the number from 0 to 9. You need to input all numbers from the left to right one by one until all finished. Once fulfilled 9 digits, then press “ENTER” to confirm.

My MMSI ID
Input MMSI
123-----

0	1
2	3
4	5
6	7
8	9



My MMSI ID
123456789

0	1
2	3
4	5
6	7
8	9

Note. You must enter your user MMSI before you can access the DSC functions. This is a once-only operation.

Individual Call/Position

Request/Group Call/Test call

Click the DSC icon and choose “Individual Call”, then choose “Input Address” or “From Phonebook”.

Take individual call as example-

First select the “Input Address”, then input 9 MMSI digits manually such as 123456789 for your address as below:

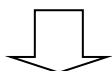
Input Address Input 9 digits 0-----  	0	1
	2	3
	4	5
	6	7
	8	9

Then select the type of individual call such as Routine

Individual Call Routine

Next select the preferred channel such as 01 port operation and confirm to call

Individual Call  							
Select Channel:							
04A	08	12	16	21A	64A	68	73
05A	09	13	17	22A	65A	69	74
06	10	14	18A	61A	66A	71	77
07A	10	15	19A	62	67	72	78A



Individual Call To: 100000000 Routine Telephony by Channel 16

Then the individual call is sent as below shown

DSC USA SQL:5 VOL:4 16 DISTRESS Elapsed 00 : 56

All Ship Call

Select the All Ship item

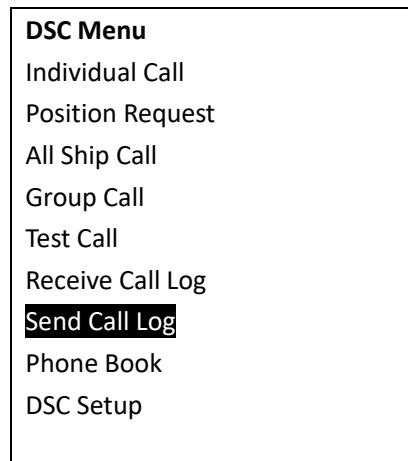
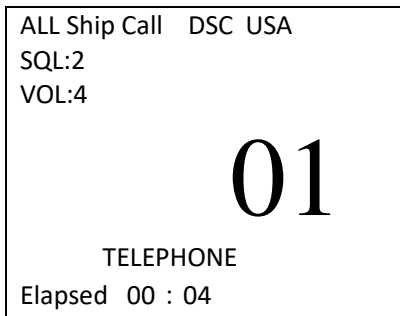
DSC Menu Individual Call Position Request All Ship Call Group Call Test Call Receive Call Log Send Call log Phone Book DSC Setup My MMSI ID
--

The All Ship Call is sent

All Ship Call Safety Urgency

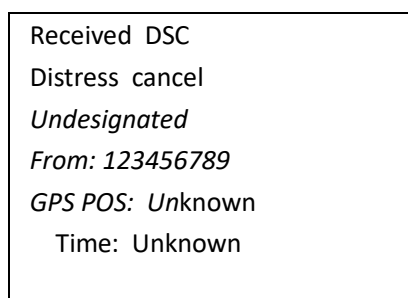
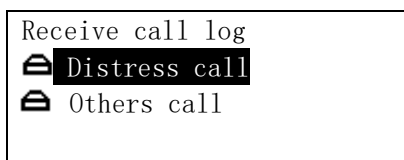
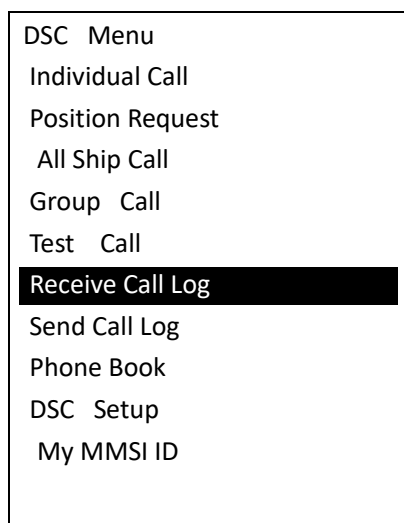
Safety Select Channel: 01 telephone 02 telephone 03 telephone 04 port ops 05 port ops/vts 06 safety 07 port ops 08 commercial

All Ship Call To : All Ship Safety Telephone by Channel 01
--



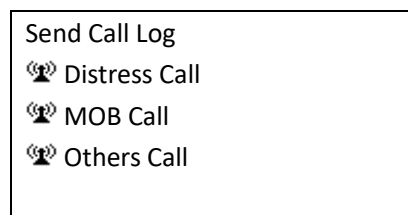
Receive Call Log

When received DSC, you can check those messages from the “Distress Menu” and see the exact message.



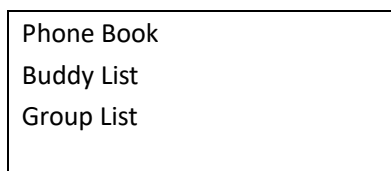
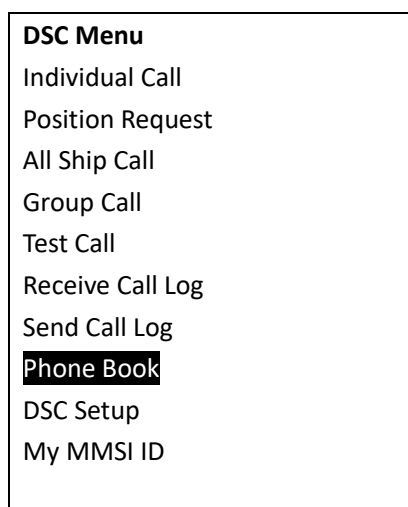
Send Call Log

Press “DSC” icon to choose “Send Call Log” item and see previous distress call, MOB call and other call that you have sent.



Phone Book

Press “DSC” icon to choose “Phone Book” item and can check the contacted ship by “Buddy List” and “Group List”



DSC Setup

Main Menu
VHF Operation
DSC Setup
AIS Setup
ATIS Operation
Position Request
DSC Operation
AIS Ship Call
System Config
Test Call
Receive Call Log
Send Call Log
Phone Book
DSC Setup
My MMSI ID

DSC Setup
Position Input
Position Reply
Test ACK

Main Menu
VHF Operation
GPS Setup
AIS Setup
ATIS Operation
DSC Operation
System config

MAIN



Click the

Click the “VHF Operation”
to enter “VHF
Operation” item as below

VHF Operation	Channel Band Set	Priority 2nd Ch	My ATIS ID
VHF Operation	Channel Band Set	Priority 2nd Ch	ATIS Function
VHF Operation	Channel Band Set	Priority 2nd Ch	My MMSI ID
VHF Operation	Channel Band Set	Priority 2nd Ch	DSC Function
VHF Operation	Channel Band Set	Priority 2nd Ch	Back Light lumi
VHF Operation	Channel Band Set	Priority 2nd Ch	Key Beep
VHF Operation	Channel Band Set	Priority 2nd Ch	Version Info
VHF Operation	Channel Band Set	Priority 2nd Ch	Factory Reset
VHF Operation	Channel Band Set	Priority 2nd Ch	Language Select

“MAIN” icon will display as below,
slide up or down to see more menus:

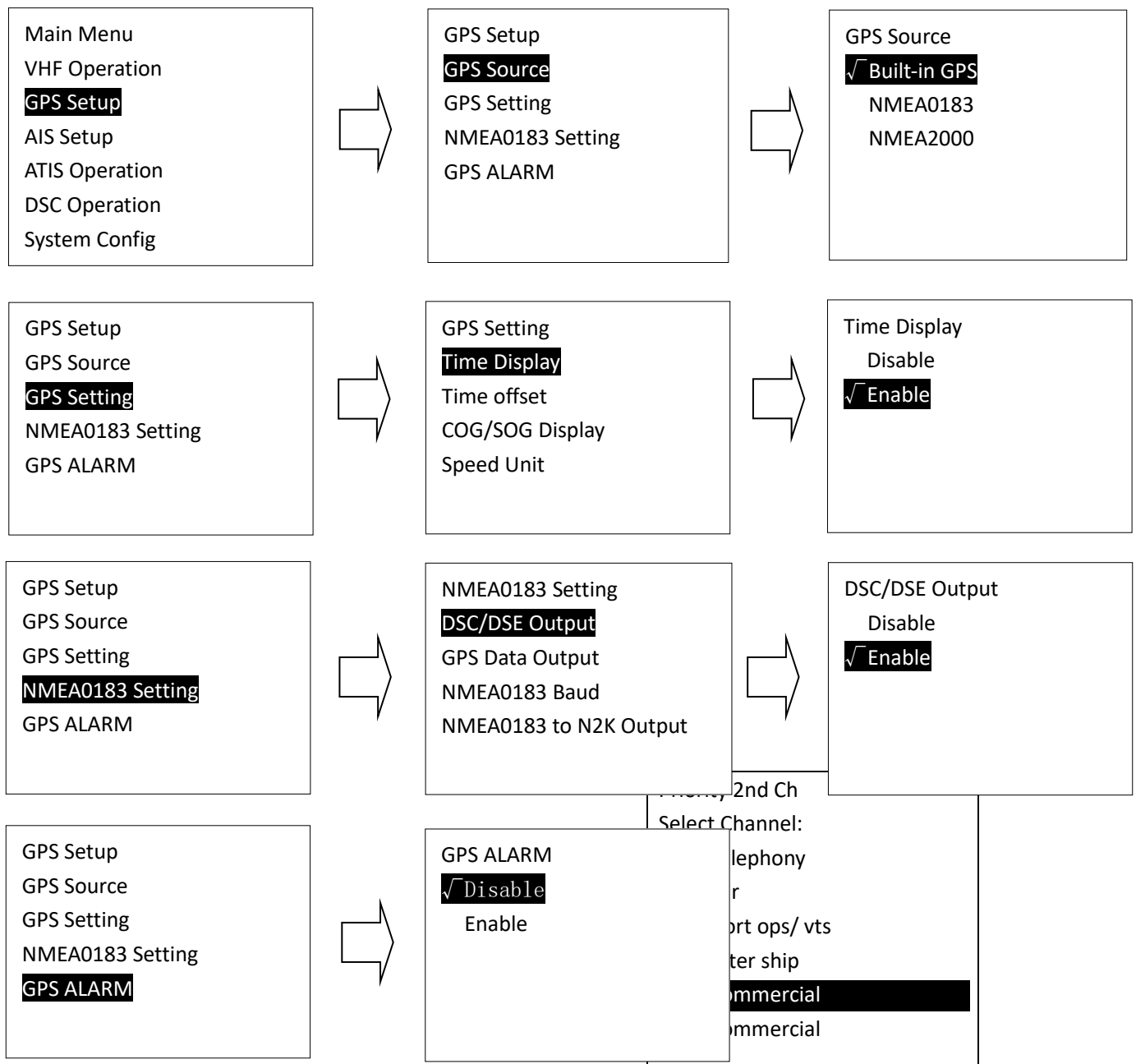
Detailed entrance for each
catalogue as shown below:

For priority 2nd Ch, you can select your preferred channel
from below as your priority second channel.

VHF Operation

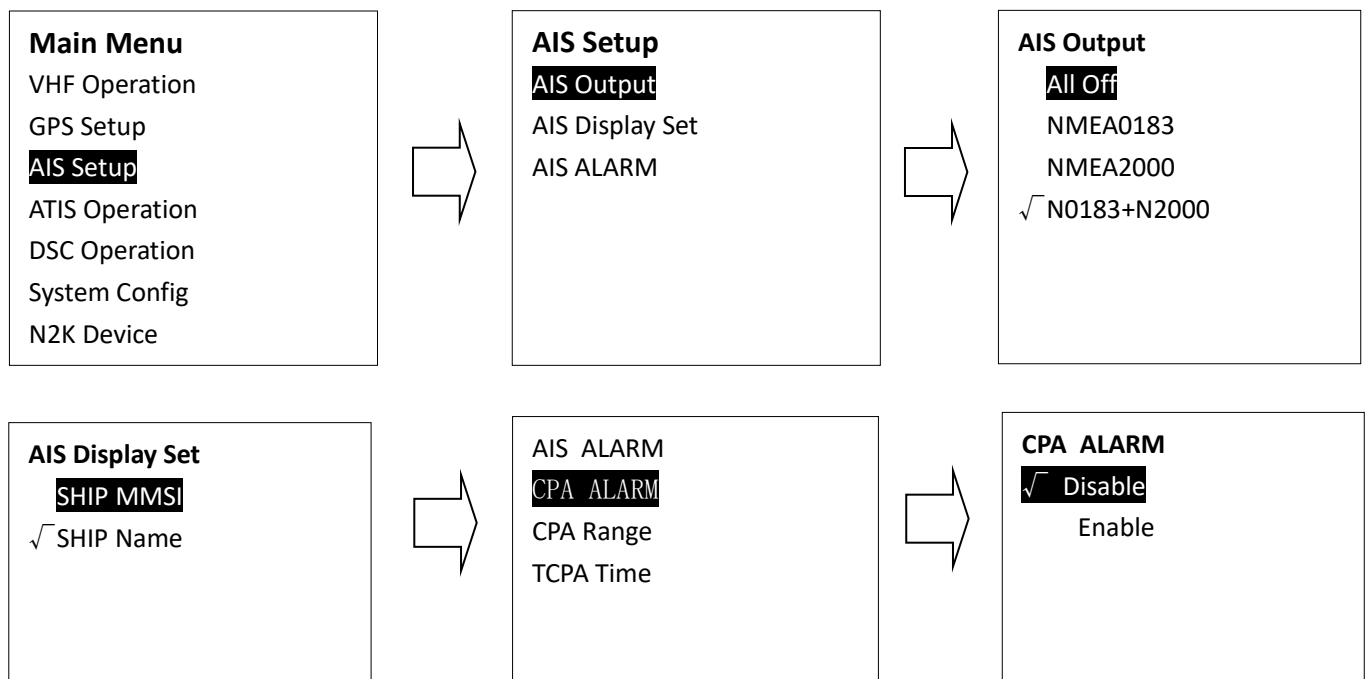
GPS Setup

Click the “GPS Setup” to enter “GPS Setup” item for setup as below shown.



AIS Setup (Only RT1050AIS)

press the “MENU” icon to enter “AIS Setup” item for setup as below shown



CPA Alarm enable Choose “Disable” or “Enable” item to enter disable or enable AIS alarm, then press “ENTER” key to confirm.

than 25.0NM, than this operation is invalid, the system will ask for re-enter, the default CPA value is 3.0NM.

CPA Range
Input Range
03.0NM

TCPA Time
Input Time
10:00Min

CPA Range (Closest point of approach) Alarm distance setup

Press UP/DOWN key to input digital one by one, after you have done this, press “ENTER” key to confirm, the maximum input range is 25.0NM, if the input value over

TCPA (Time closest point of approach) Alarm distance setup

Press UP/DOWN key to input digital one by one, after you have done this, press “ENTER” key to confirm, the maximum input range is 30 minutes, if the input value is over than 30 minutes, the input is invalid, then the system

will ask for re-enter, the default CPA value is 10:00 Min.

Main Menu
VHF Operation
GPS Setup
AIS Setup
ATIS Operation
DSC Operation
System Config
N2K Device
Dash Simulator

ATIS

Operation

Click the “ATIS Operation” to enter “ATIS Operation”

Main Menu
VHF Operation
GPS Setup
AIS Output
ATIS Operation
DSC Operation
System Config
N2K Device

(My MMSI ID setup have been explained in previous chapter, please see Page 10)

System Config

Click the “System Config” to enter “system config”

ATIS Operation
My ATIS ID
ATIS Function

Choose to press for setup or more function as you wish.

Note. You must enter your user ATIS ID before you can

access the ATIS functions. This is a once-only operation.

Main Menu
VHF Operation
GPS Setup
AIS Setup
ATIS Operation
DSC Operation
System Config
N2K Device

DSC

Operation

Click the “DSC Operation” to enter “DSC Operation”

System Config
Back Light lumi
Key Beep
Version Info
Factory Reset
Language Select

DSC Operation
My MMSI ID
DSC Function

N2K Device

Display the list of device connected in NMEA2000.

Dash simulator

Demonstrate the dashboard.

Distress Menu & Send the Distress

Message

Pull the DISTRESS red cover and press the DISTRESS key. Then below “Distress Menu” will be displayed on LCD.

NO.	01/05	MMIS	Bearing	distance
01	413903183	257°	0.79NM	
02	413997668	256°	0.80NM	
03	413401340	259°	1.25NM	
04	413454520	239°	1.28NM	
05	000000000	277°	1.49NM	

Choose one distress item

such as “sinking”, press and hold this for more than 3 seconds for transmitting sinking message out.

- Distress Menu**
 Undesignated
 Fire, Explosion
 Flooding
 Collision
 Grounding
 Capsizing
 Sinking
 Adrift
 Abandoning
 Piracy
 Man Overboard

AIS
Operation(O
nly
RT1050AIS)



Click the “ AIS” icon to enter this interface.

- Distress Menu
 Undesignated
 Fire, Explosion
 Flooding
 Collision
 Grounding
 Capsizing
Sinking

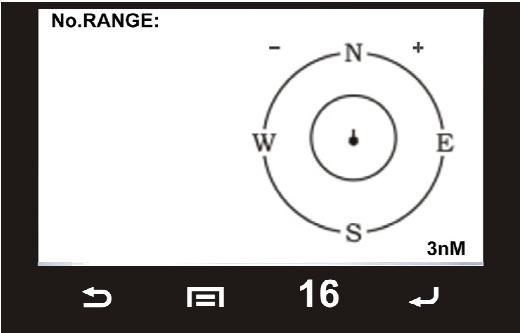
From the AIS ship info menu, you have three options: List mode, plotter mode, AIS Alarm list alarm list

mode. If you choose option ‘AIS ship info list’ and press ‘enter’, you will open the list mode.

You can also choose to resend, pause or exit after this message was sent.

- Ship Info menu
Ship info List
 Ship plotter
 AIS Alarm list

If you choose option ‘All ship plotter’ and press ‘enter’, you will open the plotter mode.



when the CPA ALARM is turned on,If you choose option 'AIS Alarm List' and press enter, you will open the AIS alarm list mode.

NO.	MMIS	01/04
01	413903183	233° 0.96nM
02	000000000	237° 5.54nM
03	000000000	265° 1.13nM
04	413401340	277° 1.48nM

From either mode, you can choose a target with Confirm key, then press enter to display the target details.

LANGUE

Click the "LANGUE" icon to select language,you can select English or french.

DIMMER SETTING

Use the button"DIM"to enter the dimmer setting page. At Homepage1,You can see GPS information if received,

channel,SQL,VOL,HI/LO power.You can click  key to return to homepage.

25W

DSC

SCAN

CAN

Dist

COG:0.009

SCG:0.032

19:52:46 UTC

22°36'1828"N

113°49.7567'E

NAME:01

Lat:22°36'1828"N

Lon:113°48.922'E

Bearing:232°

Dist:0.96nM

SOG:0.0KIS

COG:225.4°

Rot:----

16

TELEPHONE

SQL:8

VOL:8

DIM

SCAN

PSCAN

DUAL

TRIW

AIS

16

**6.Other
Features
and**

BAND

Click the "BAND" icon to select band.Click the band you

want,click  to ensure.

BAND SELECT

USA

• INT

CAN

WX

PRIVATE

WX ALARM

16

Solutions

Special function keys

If you press and hold the"DISTRESS"Key then power on, you can enter the up grade mode directly. LCD display as below:

The software's
Upgrading by PC
Please wait----

If you press and hold the"PTT"Key then power on, later you can enter the writing channel mode directly. LCD display as below:

The Private
Channels are
Cloning by PC

AE	Auxiliary Equipment
CE	Conducted Emissions
EMC	Electromagnetic Compatibility
EN	European Norm
EUT	Equipment Under Test
FTB	Fast Transient Burst
MED	Marine Equipment Directive
QP	Quasi Peak

TX Time Out

The transmission will be automatically turned off after PTT key pressed over 5 consecutive minutes. The TX mode will be terminated and back to Rx mode. Once the PTT key is released, the TX time out timer will be reset. PTT key will back to work normally.

The Local Time & Date on Screen:

When RT1050 cannot receive the GPS signal to display the current position, screen will automatic display the time and date. When radio received the GPS signal, screen will show the current GPS location, related UTC time and date will be shown below the GPS location mark.

Click “MAIN” and enter “GPS Setup” to select the “Time offset” item for setting user’s local time based on UTC time. Then press “Enter” to confirm. User need to pass the entire item from hour-minute-second then able to see enter option to click and confirm.

In other words, the process is the same as your setup of local time on your computer.

NMEA 0183 and NMEA 2000

The RT1050AIS can be connected to both NMEA0183 and NMEA2000 networks. When you connect your radio to a NMEA0183 network or a NMEA2000 network, the following data can be transferred; the radio can receive GPS position. GPS position can be displayed on the screen and is transmitted with DSC calls. When GPS data is not present, the radio will signal for you to enter your position manually every four hours.

This setting indicates whether you are connected to a NMEA0183 or NMEA2000 network; the radio can communicate over two networks at the same time.

Compass safe distance is 0.8m

Appendix A – List of Abbreviations

RT1050/RT1050AIS COMMUNICATION PGN

RT1050AIS SEND NMEA2000 PGN:

59392	ISO acknowledgement
60928	ISO Address Claim
126208	Nmea request/command/acknowledge Group function
126464	PGN List
126720	fast data packet, multi_frame, proprietary PGN
126996	Product information
129799	Radio frequency/Mode/power
129025	Position,rapid update
129026	COG/SOG Rapid update
129033	time & date update
129038	Class A position report (Rx,Tx) note:ais msg 1/2/3
129039	Class B position report (Rx,Tx) note:ais msg 18
129040	Class B ext_position report (Rx,Tx) note:ais msg 19
129793	UTC and date report (Tx) note:ais msg 4/11
129794	Class A static and voyage related data (Rx,Tx) note:ais msg 5
129801	Addressed safety msg (Rx,Tx) note:ais msg 12
129802	Broadcast safety msg (Rx,Tx) note:ais msg 14
129808	Dsc call information
129809	AIS Class B 'CS'Static Data Report, Part A note:ais msg 24A
129810	AIS Class B 'CS'Static Data Report, Part B note:ais msg 24B

RT1050 SEND NMEA2000 PGN:

59392	ISO acknowledgement
60928	ISO Address Claim
126208	Nmea request/command/acknowledge Group function
126464	PGN List
126720	fast data packet,multi_frame, proprietary PGN
126996	Product information
129025	Position,rapid update
129026	COG/SOG Rapid update
129033	time & date update
129799	Radio frequency/Mode/power
129808	Dsc call information

RT1050 AND RT1050AIS RECEIVE NMEA2000 PGN:

59392	ISO acknowledgement
59904	ISO request
60928	ISO Address Claim
126208	Nmea request/command/acknowledge Group function
126464	PGN List
129026	COG/SOG Rapid update
129029	GNSS Position data

International Marine VHF Channels & Frequencies				
CH	TX Freq	RX Freq	Simplex	Freq Use
1	156.050	160.650		Public Correspondence, Port Operations and Ship Movement
2	156.100	160.700		Public Correspondence, Port Operations and Ship Movement
3	156.150	160.750		Public Correspondence, Port Operations and Ship Movement
4	156.200	160.800		Public Correspondence, Port Operations and Ship Movement
5	156.250	160.850		Public Correspondence, Port Operations and Ship Movement
6	156.300	156.300	x	Inter-ship [1]
7	156.350	160.950		Public Correspondence, Port Operations and Ship Movement
8	156.400	156.400	x	Inter-ship
9	156.450	156.450	x	Inter-ship, Port Operations and Ship Movement
10	156.500	156.500	x	Inter-ship, Port Operations and Ship Movement [2]
11	156.550	156.550	x	Port Operations and Ship Movement
12	156.600	156.600	x	Port Operations and Ship Movement
13	156.650	156.650	x	Inter-ship Safety, Port Operations and Ship Movement [3]
14	156.700	156.700	x	Port Operations and Ship Movement
15	156.750	156.750	x	Inter-ship and On-board Communications at 1W only [4]
16	156.800	156.800	x	Distress, Safety and Calling
17	156.850	156.850	x	Inter-ship and On-board Communications at 1W only [4]
18	156.900	161.500		Public Correspondence, Port Operations and Ship Movement
19	156.950	161.550		Public Correspondence, Port Operations and Ship Movement
20	157.000	161.600		Public Correspondence, Port Operations and Ship Movement
21	157.050	161.650		Public Correspondence, Port Operations and Ship Movement
22	157.100	161.700		Public Correspondence, Port Operations and Ship Movement
23	157.150	161.750		Public Correspondence, Port Operations and Ship Movement
24	157.200	161.800		Public Correspondence, Port Operations and Ship Movement
25	157.250	161.850		Public Correspondence, Port Operations and Ship Movement
26	157.300	161.900		Public Correspondence, Port Operations and Ship Movement
27	157.350	161.950		Public Correspondence, Port Operations and Ship Movement
28	157.400	162.000		Public Correspondence, Port Operations and Ship Movement
60	156.025	160.625		Public Correspondence, Port Operations and Ship Movement
61	156.075	160.675		Public Correspondence, Port Operations and Ship Movement
62	156.125	160.725		Public Correspondence, Port Operations and Ship Movement
63	156.175	160.775		Public Correspondence, Port Operations and Ship Movement
64	156.225	160.825		Public Correspondence, Port Operations and Ship Movement
65	156.275	160.875		Public Correspondence, Port Operations and Ship Movement
65A	156.275	156.275		Non-Commercial
66	156.325	160.925		Public Correspondence, Port Operations and Ship Movement
66A	156.325	156.325		Non-Commercial
67	156.375	156.375	x	Inter-ship, Port Operations and Ship Movement [2]
68	156.425	156.425	x	Port Operations and Ship Movement
69	156.475	156.475	x	Inter-ship, Port Operations and Ship Movement
71	156.575	156.575	x	Port Operations and Ship Movement

International Marine VHF Channels & Frequencies				
CH	TX Freq	RX Freq	Simplex	Freq Use
72	156.625	156.625	x	Inter-ship
73	156.675	156.675	x	Inter-ship [2]
74	156.725	156.725	x	Port operations and Ship movement
75	156.775	156.775	x	See Note [5]
76	156.825	156.825	x	See Note [5]
77	156.875	156.875	x	Inter-ship
78	156.925	161.525		Public correspondence, Port Operations and Ship Movement
79	156.975	161.575		Public correspondence, Port Operations and Ship Movement
80	157.025	161.625		Public correspondence, Port Operations and Ship Movement
81	157.075	161.675		Public correspondence, Port Operations and Ship Movement
82	157.125	161.725		Public correspondence, Port Operations and Ship Movement
83	157.175	161.775		Public correspondence, Port Operations and Ship Movement
84	157.225	161.825		Public correspondence, Port Operations and Ship Movement
85	157.275	161.875		Public correspondence, Port Operations and Ship Movement
86	157.325	161.925		Public correspondence, Port Operations and Ship Movement
87	157.375	157.375	x	Port Operations and Ship Movement
88	157.425	157.425	x	Port Operations and Ship Movement

◆ Inter-ship channels are for communications between ship stations. Inter-ship communications should be restricted to Channels 6, 8, 72 and 77. If these are not available, the other channels marked for Inter-ship may be used.

◆ Channel 70 is used exclusively for Digital Selective Calling (DSC) and is not available for regular voice communications.

Notes:

1. Channel 06 may also be used for communications between ship stations and aircraft engaged in coordinated search and rescue operations. Ship stations should avoid harmful interference to such communications on channel 06 as well as to communications between aircraft stations, ice breakers and assisted ships during ice seasons.
2. Within the European Maritime Area and in Canada, channels 10, 67 and 73 may also be used by the individual administrations concerned for communication between ship stations, aircraft stations and participating land stations engaged in coordinated search and rescue and anti-pollution operations in

local areas. Channels 10 or 73 (depending on location) are also used for the broadcast of Marine Safety Information by the Maritime and Coast Guard Agency in the UK only.

3. Channel 13 is designated for use on a worldwide basis as a navigation safety communication channel, primarily for inter-ship navigation safety communications.
4. Channels 15 and 17 may also be used for on-board communications provided the effective radiated power does not exceed 1 Watt.
5. The use of Channels 75 and 76 should be restricted to navigation related communication only and all precautions should be taken to avoid harmful interference to channel 16. Transmit power is limited to 1 Watt.

U.S. Marine VHF Channels and Frequencies				
CH	TX Freq	RX Freq	Simplex	Freq Use
01A	156.050	156.050	x	Port Operations and Commercial, VTS. Available only in New Orleans / Lower Mississippi area.
03A	156.150	156.150	x	U.S. Government only
05A	156.250	156.250	x	Port Operations or VTS in the Houston, New Orleans and Seattle areas.
6	156.300	156.300	x	Inter-ship Safety
07A	156.350	156.350	x	Commercial
8	156.400	156.400	x	Commercial (Inter-ship only)
9	156.450	156.450	x	Boater Calling. Commercial and Non-Commercial.
10	156.500	156.500	x	Commercial
11	156.550	156.550	x	Commercial. VTS in selected areas.
12	156.600	156.600	x	Port Operations. VTS in selected areas.
13	156.650	156.650	x	Inter-ship Navigation Safety (Bridge-to-bridge). Ships >20meters in length maintain a listening watch on this channel in US waters.
14	156.700	156.700	x	Port Operations. VTS in selected areas.
15	—	156.750	x	Environmental (Receive only). Used by Class 'C' EPIRBS.
16	156.800	156.800	x	International Distress, Safety and Calling. Ships required to carry radio, USCG, and most coast stations maintain a listening watch on this channel.
17	156.850	156.850	x	State Control
18A	156.900	156.900	x	Commercial
19A	156.950	156.950	x	Commercial
20	157.000	161.600		Port Operations (duplex)
20A	157.000	157.000	x	Port Operations
21A	157.050	157.050	x	U.S. Coast Guard only
22A	157.100	157.100	x	Coast Guard Liaison and Maritime Safety Information Broadcasts. Broadcasts announced on channel 16.
23A	157.150	157.150	x	U.S. Coast Guard only
24	157.200	161.800		Public Correspondence (Marine Operator)
25	157.250	161.850		Public Correspondence (Marine Operator)
26	157.300	161.900		Public Correspondence (Marine Operator)
27	157.350	161.950		Public Correspondence (Marine Operator)
28	157.400	162.000		Public Correspondence (Marine Operator)
61A	156.075	156.075	x	U.S. Government only
63A	156.175	156.175	x	Port Operations and Commercial, VTS. Available only in New Orleans / Lower Mississippi area.
64A	156.225	156.225	x	U.S. Coast Guard only
65A	156.275	156.275	x	Port Operations
66A	156.325	156.325	x	Port Operations
67	156.375	156.375	x	Commercial. Used for Bridge-to-bridge communications in lower Mississippi River. Inter-ship only.
68	156.425	156.425	x	Non-Commercial

U.S. Marine VHF Channels and Frequencies				
CH	TX Freq	RX Freq	Simplex	Freq Use
69	156.475	156.475	x	Non-Commercial
70	156.525	156.525	x	Non-Commercial
71	156.575	156.575	x	Non-Commercial
72	156.625	156.625	x	Non-Commercial (Inter-ship only)
73	156.675	156.675	x	Port Operations
74	156.725	156.725	x	Port Operations
77	156.875	156.875	x	Port Operations (Inter-ship only)
78A	156.925	156.925	x	Non-Commercial
79A	156.975	156.975	x	Commercial. Non-Commercial in Great Lakes only.
80A	157.025	157.025	x	Commercial. Non-Commercial in Great Lakes only
81A	157.075	157.075	x	U.S. Government only – Environmental protection operations.
82A	157.125	157.125	x	U.S. Government only
83A	157.175	157.175	x	U.S. Coast Guard only
84	157.225	161.825		Public Correspondence (Marine Operator)
84A	157.225	157.225		Non-Commercial
85	157.275	161.875		Public Correspondence (Marine Operator)
85A	157.275	157.275		Non-Commercial
86	157.325	161.925		Public Correspondence (Marine Operator)
86A	157.325	157.325		Non-Commercial
87	157.375	161.975		Public Correspondence Marine Operator)
87A	157.375	157.375		Non-Commercial
88	157.425	162.025		Public Correspondence only near Canadian border
88A	157.425	157.425	x	Commercial, Inter-ship only

- ◆ Recreational boaters normally use channels listed as Non-Commercial: 68, 69, 71, 72, 78A.
 - ◆ Channel 70 is used exclusively for Digital Selective Calling (DSC) and is not available for regular voice communications.
 - ◆ Channels 75 and 76 are reserved as guard bands for Channel 16 and are not available for regular voice communications.
3. Channel is Receive Only.
 4. Channel 16 is used for calling other stations or for distress alerting.
 5. Output power is fixed at 1 watt only.
 6. Output power is initially set to 1 watt. User can temporarily override this restriction to transmit at high power.

Notes:

1. The letter “A” following a channel number indicates simplex use of the ship station transmit side of an international semi-duplex channel. Operations are different from that of international operations on that channel.
2. Channel 13 should be used to contact a ship when there is danger of collision. All ships of length 20 meters or greater are required to guard VHF channel 13, in addition to VHF channel 16, when operating

Canadian Marine VHF Channels and Frequencies

CH	TX Freq	RX Freq	Area of Operation Use
1	156.050	160.650	PC Public Correspondence
2	156.100	160.700	PC Public Correspondence
3	156.150	160.750	PC Public Correspondence
04A	156.200	156.200	PC Inter-ship, Ship/Shore and Safety: Canadian Coast Guard S&R
05A	156.250	156.250	Ship Movement
6	156.300	156.300	All areas Inter-ship, Commercial, Non commercial and Safety: May Be used for search and rescue communications between ships and aircraft.
07A	156.350	156.350	All areas Inter-ship, Ship/Shore, Commercial
8	156.400	156.400	WC, EC Inter ship, Commercial and Safety: Also assigned for operations in the Lake Winnipeg area.
9	156.450	156.450	AC Inter-ship, Ship/Shore, Commercial, Non-commercial and Ship Movement: May be used to communicate with aircraft and Helicopters in predominantly maritime support operations.
10	156.500	156.500	AC, GL Inter-ship, Ship/Shore, Commercial, Non-commercial, Safety and Ship Movement: May also be used for communications with aircraft engaged in coordinated search and rescue and antipollution operations.
11	156.550	156.550	PC, AC, GL Inter-ship, Ship/Shore, Commercial, Non-commercial and Ship Movement: Also used for pilotage purposes.
12	156.600	156.600	WC, AC, GL Inter-ship, Ship/Shore, Commercial, Non-commercial and Ship Movement: Port operations and pilot information and messages.
13	156.650	156.650	All areas Inter-ship, Commercial, Non-commercial and Ship Movement: Exclusively for bridge-to-bridge navigational traffic. Limited to 1-watt maximum power.
14	156.700	156.700	AC, GL Inter-ship, Ship/Shore, Commercial, Non-commercial and Ship Movement: Port operations and pilot information and Messages.
15	156.750	156.750	All areas Inter-ship, Ship/Shore, Commercial, Non-commercial and Ship Movement: All May also be used for on-board Communications.
16	156.800	156.800	All areas International Distress, Safety and Calling.
17	156.850	156.850	All areas Inter-ship, Ship/Shore, Commercial, Non-commercial and Ship Movement: All operations limited to 1-watt maximum power. May also be used for on-board Communications.
18A	156.900	156.900	All areas Inter-ship, Ship/Shore and Commercial: Towing on the Pacific Coast.
19A	156.950	156.950	All areas except PC Inter-ship and Ship/Shore: Canadian Coast Guard only.
20	157.000	161.600	All areas Ship/Shore, Safety and Ship Movement: Port operation
21A	157.050	157.050	All areas Inter-ship and Ship/Shore: Canadian Coast Guard only.
21B	—	161.650	All areas Safety: Continuous Marine Broadcast (CMB) service.

Canadian Marine VHF Channels and Frequencies			
CH	TX Freq	RX Freq	Area of Operation Use
22A	157.100	157.100	All areas Inter-ship, Ship/Shore, Commercial and Non-commercial: For communications between Canadian Coast Guard and non-Canadian Coast Guard stations only.
23	157.150	161.750	PC Ship/Shore and Public Correspondence: Also in the inland waters of British Columbia and the Yukon.
23B	—	161.750	Continuous Marine Broadcast Service
24	157.200	161.800	All areas Ship/Shore and Public Correspondence
25	157.250	161.850	PC Ship/Shore and Public Correspondence: Also assigned for operations in the Lake Winnipeg area.
25B	—	161.850	AC Safety: Continuous Marine Broadcast (CMB) service.
26	157.300	161.900	All areas Ship/Shore, Safety and Public Correspondence
27	157.350	161.950	AC, GL, PC Ship/Shore and Public Correspondence
28	157.400	162.000	PC Ship/Shore, Safety and Public Correspondence
28B	—	162.000	AC Safety: Continuous Marine Broadcast (CMB) service.
60	156.025	160.625	PC Ship/Shore and Public Correspondence.
61A	156.075	156.075	EC Inter-ship, Ship/Shore and Commercial: Commercial fishing only.
62A	156.125	156.125	EC Inter-ship, Ship/Shore and Commercial: Commercial fishing only.
63A	156.175	156.175	Tow Boats - BCC area
64	156.225	160.825	PC Ship/Shore and Public Correspondence
64A	156.225	156.225	EC Inter-ship, Ship/Shore and Commercial: Commercial fishing only.
65A	156.275	156.275	Inter-ship, Ship/Shore, Commercial, Non-commercial, Safety: Search & rescue and antipollution operations on the Great Lakes. Towing on the Pacific Coast. Port operations only in the St. Lawrence River areas with 1W maximum power. Pleasure craft in the inland waters of Alberta, Saskatchewan and Manitoba (excluding Lake Winnipeg and the Red River).
66A	156.325	156.325	Inter-ship, Ship/Shore, Commercial, Non-commercial, Safety and Ship Movement: Port operations only in the St. Lawrence River/Great Lakes Areas with 1-watt maximum power.
67	156.375	156.375	All areas except EC Inter-ship, Ship/Shore, Commercial, Non-commercial, Safety: May also be used for communications with aircraft engaged in coordinated search and rescue and antipollution operations.
68	156.425	156.425	All areas Inter-ship, Ship/Shore and Non-commercial: For marinas and yacht clubs.
69	156.475	156.475	All areas except EC Inter-ship, Ship/Shore, Commercial and Non-commercial
71	156.575	156.575	PC Inter-ship, Ship/Shore, Commercial, Non-commercial, Safety and Ship Movement the East Coast and on Lake Winnipeg.
72	156.625	156.625	EC, PC Inter-ship, Commercial and Non-commercial: May be used to communicate with aircraft and helicopters in predominantly maritime support

Canadian Marine VHF Channels and Frequencies			
CH	TX Freq	RX Freq	Area of Operation Use
73	156.675	156.675	All areas except EC Inter-ship, Ship/Shore, Commercial, Non-commercial, Safety: May also be used for communications with aircraft engaged in coordinated search and rescue and antipollution operations.
74	156.725	156.725	EC, PC Inter-ship, Ship/Shore, Commercial, Non-commercial and Ship Movement.
75	156.775	156.775	Simplex port operation, Ship movement and navigation related communication only. 1 watt maximum
76	156.825	156.825	Simplex port operation, Ship movement and navigation related communication only. 1 watt maximum
77	156.875	156.875	Inter-ship, Ship/Shore, Safety and Ship Movement: Pilotage on Pacific Coast. Port operations only in the St. Lawrence River/Great Lakes areas with 1W maximum power.
78A	156.925	156.925	EC, PC Inter-ship, Ship/Shore and Commercial
79A	156.975	156.975	EC, PC Inter-ship, Ship/Shore and Commercial
80A	157.025	157.025	EC, PC Inter-ship, Ship/Shore and Commercial
81A	157.075	157.075	Inter-ship and Ship/Shore: Canadian Coast Guard use only in the St. Lawrence River/ Great Lakes areas.
82A	157.125	157.125	Inter-ship and Ship/Shore: Canadian Coast Guard use only in the St. Lawrence River/ Great Lakes areas.
83A	157.175	157.175	EC Inter-ship and Ship/Shore: Canadian Coast Guard and other Government agencies.
83B	—	161.775	AC, GL Safety: Continuous Marine Broadcast (CMB) Service.
84	157.225	161.825	PC Ship/Shore and Public Correspondence
85	157.275	161.875	AC, GL, NL Ship/Shore and Public Correspondence
86	157.325	161.925	PC Ship/Shore and Public Correspondence
87	157.375	161.975	AC, GL, NL Ship/Shore and Public Correspondence
88	157.425	162.025	AC, GL, NL Ship/Shore and Public Correspondence

AC: Atlantic Coast, Gulf and St. Lawrence River up to and including Montreal

EC: (East Coast): includes NL, AC, GL and Eastern Arctic areas

GL: Great Lakes (including St. Lawrence above Montreal)

NL: Newfoundland and Labrador

PC: Pacific Coast

WC: (West Coast): Pacific Coast, Western Arctic and Athabasca-Mackenzie Watershed areas All areas: includes East and West Coast areas

Notes:

- An “A” following a channel number indicates simplex use of the ship station transmit side of an international
- duplex channel. Operations are different from that of international operations on that channel.
- Channel 16 is used for calling other stations or for distress alerting.
- The letter “B” following a channel number indicates simplex use of the coast station transmit side of an international duplex channel. That is, the channel is Receive Only.
- Channel 70 is used exclusively for Digital Selective Calling (DSC) and is not available for regular voice communications.
- Channels 75 and 76 are reserved as guard bands for Channel 16 and are not available for regular voice communications.

European Private Channels and Frequencies

In addition to the channels listed above in the International Marine VHF Channels & Frequencies table, your radio may also include some of the following private channels. Which channels are included depend upon the country in which the radio is to be operated and whether you possess the appropriate licensing

Country	CH	TX Freq	RX Freq	Freq Use
Belgium	96	162.425	162.425	Marina
Denmark	L1	155.500	155.500	Leisure
	L2	155.525	155.525	Leisure
Denmark, Finland, Norway & Sweden	F1	155.625	155.625	Fishing
	F2	155.775	155.775	Fishing
	F3	155.825	155.825	Fishing
Finland, Norway&Sweden	L1	155.500	155.500	Leisure
	L2	155.525	155.525	Leisure
	L3	155.650	155.650	Leisure
Netherlands	31	157.550	162.150	Marina
	37	157.850	157.850	Leisure
UK	M1	157.850	157.850	Marina
	M2	161.425	161.425	Marina

Note: A license may be required to operate the radio on the private channels. It is your responsibility to obtain the proper license to operate the radio on these frequencies.

Weather Channels and Frequencies

WX channel	Frequency(MHz)		Remarks
	Transmit	Receive	
1	RX only	162.550	Weather(receive only)
2	RX only	162.400	Weather(receive only)
3	RX only	162.475	Weather(receive only)
4	RX only	162.425	Weather(receive only)
5	RX only	162.450	Weather(receive only)
6	RX only	162.500	Weather(receive only)
7	RX only	162.525	Weather(receive only)
8	RX only	161.650	Weather(receive only)
9	RX only	161.775	Weather(receive only)
10	RX only	163.275	Weather(receive only)

Specifications

---VHF radio

TX Frequency.....	156.025--157.425MHz
RX Frequency.....	156.300--162.000MHz
Digital Selectivity Calling (DSC).....	Class-D with dual receiver (individual CH70)
CH70.....	156.525MHz
Channel spacing.....	25kHz
Channel banks.....	All INT/USA/Canadian 10 WX (only available for USA and Canada)
Modulation mode.....	FM (16K0G3E), DSC/ATIS (16K0G2B)
Antenna impedance.....	50Ω (nominal)
Power supply.....	13.8V DC
Sensitivity at 12dB SINAD.....	≤-6 dBμV (EMF)
Squelch sensitivity.....	≤-6 dBμ (EMF)
Spurious Resp.Rej.....	70 dB
Adjacent Channel Rejection.....	70 dB
Audio output power.....	5W @ 4Ω
Audio Power Output (hailer).....	20W @ 4Ω
Audio Distortion.....	5%
RF Output power.....	High:25W / Low:1W
Harmonic Emissions.....	0.25μW
Current drain, Stdbby / TX (high) / RX	0.5A/ 6A / 1A (@ 13.8V
Maximum frequency deviation.....	±5.0kHz
Local Oscillator mode.....	PLL
Ambient operating temperatures.....	-15°C to +55°C
Waterproof.....	IP67
Compass safe distance.....	0.8m
Buddy list (RT1050\RT1050AIS).....	20/50/100
Private channels.....	99

---Communications

Comm. port NMEA 0183.....	9600 baud
Comm. port NMEA 2000 (RT1050\RT1050AIS only).....	NMEA 2000
NMEA 0183 input (receive).....	RMC, GGA, GLL, ZDA, VTG, GSV
NMEA 0183 output (transmit).....	DSC (for DSC call), DSE (for enhanced position) AIVDM (AIS)

---AIS Receiver

Frequency	161.9750MHz/162.025MHz
Number of Channels.....	(2) Dual Channels

---Dimension & Weight

Fixed unit dimensions (L/W/H).....	180 mm x 91 mm x 38 mm
Fixed unit dimensions on mounting bracket.....	195 mm x 115 mm x 38 mm
Fixed unit Weight.....	1.0 kg

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