



SERVICE MANUAL

MF/HF RADIO (GMDSS)


NHR-1500



NOTICE


Ensuring the safety of vessel is the obligatory responsibility of the navigation officer.

The use of the equipment does not relieve the user from the need to take any safety precautions or checks whether it is mandatory or otherwise in accordance to international and national rules.

SAFETY INSTRUCTIONS

 NOTICE	This notice indicates an unsafe operation that, if not avoided, could result in property damage or equipment malfunction.
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 WARNING	
	High Voltages are located over many areas in the systems!
Caution during Operations: Never touch or have any body contact with active electrical circuits!	
All relevant safety regulations and safety standards must be closely observed.	

 CAUTION	
Maintenance and repairs must only be carried out by trained and qualified personnel with knowledge of electrical devices.	
Observe handling regulations! Removal or insertion of a subgroup or printed wiring board with live voltage can lead to severe damage.	
Never insert fuses with values other than those stipulated!	

FOREWORD

This Manual provides installation and commissioning information for the NHR-1500. The manual is intended for use by qualified installation personnel only.

Installation and maintenance must only be undertaken by qualified service engineers or by New Sunrise Ltd and approved agents. Unauthorized repair of equipment during the Warranty period may invalidate the Warranty. If you wish to undertake the maintenance of the equipment, please ensure that the service engineers hold a valid authorization certificate issued by New Sunrise Ltd.

If a unit exhibits an issue that cannot be rectified onboard, and a service engineer is required to attend your vessel, please contact our Service Centre, giving full details of the following:

1. Name of vessel (Phone number if available)
2. Equipment type and Serial Number
3. Software status (version number)
4. Next port of call, ETA/ETD and ship's agents
5. Fault description (with as much detail as possible)
6. Contact Name

You can find detailed contact information on the website: www.nsrmarine.com

MODIFY RECORD

No.	Modify by	Date	Paragraph	Version	Reason
1	Q/A	2025/08/06		01	First edition
2	Q/A	2025/10/18	2.1, 2.4.2, 2.5, 3	02	Some modification

VERSION COMPARISON TABLE

Manual Version	Program Version	Remarks
20250806_01	Transceiver: CTRL: 1.17 20241124 Control Unit: APP : 1.25 20250304	
20251018_02	Transceiver: CTRL: 1.18 20250814 Control Unit: APP : 1.27 20250901	

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1. OVERVIEW

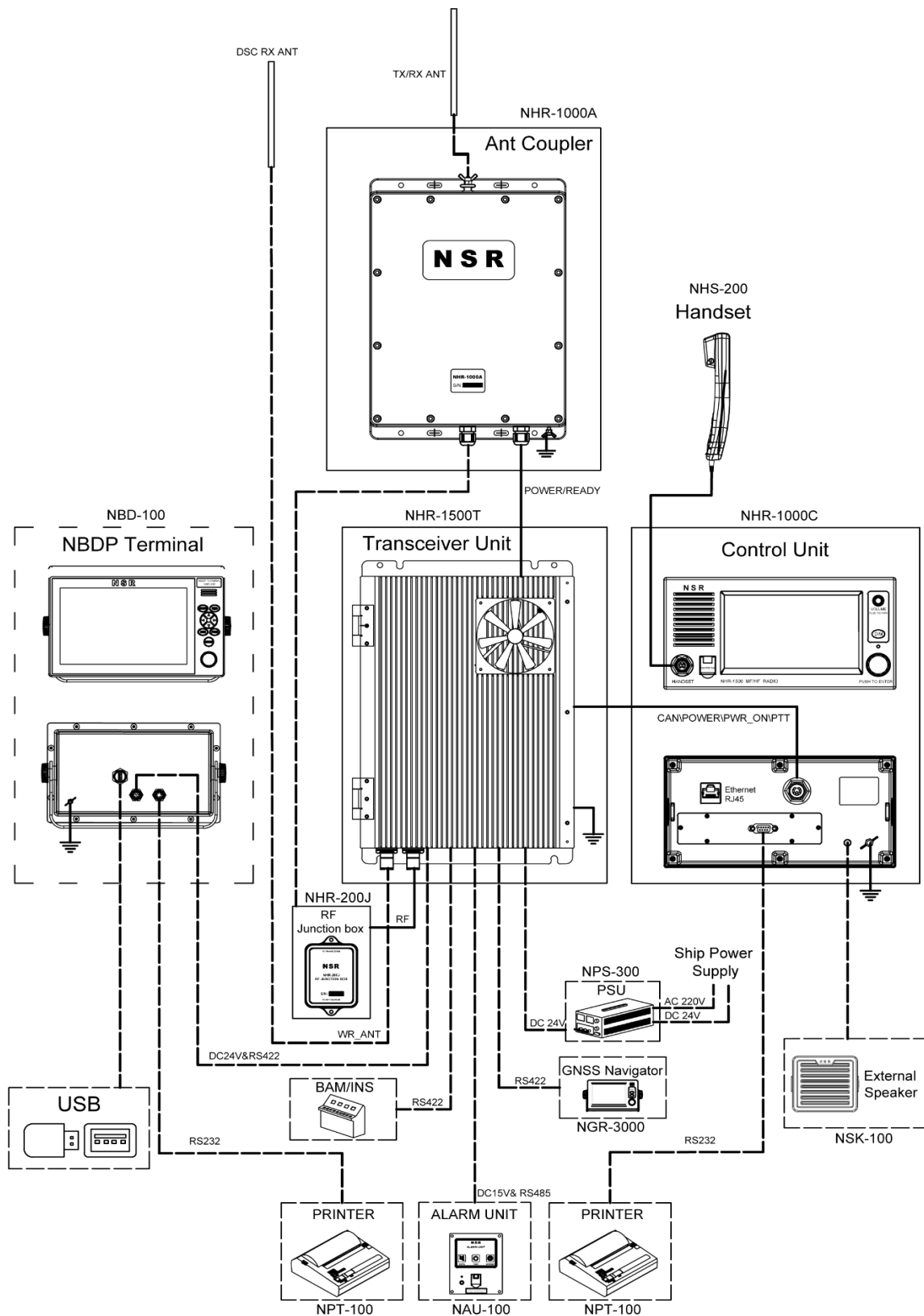


Fig 1-1 System diagram of NHR-1500

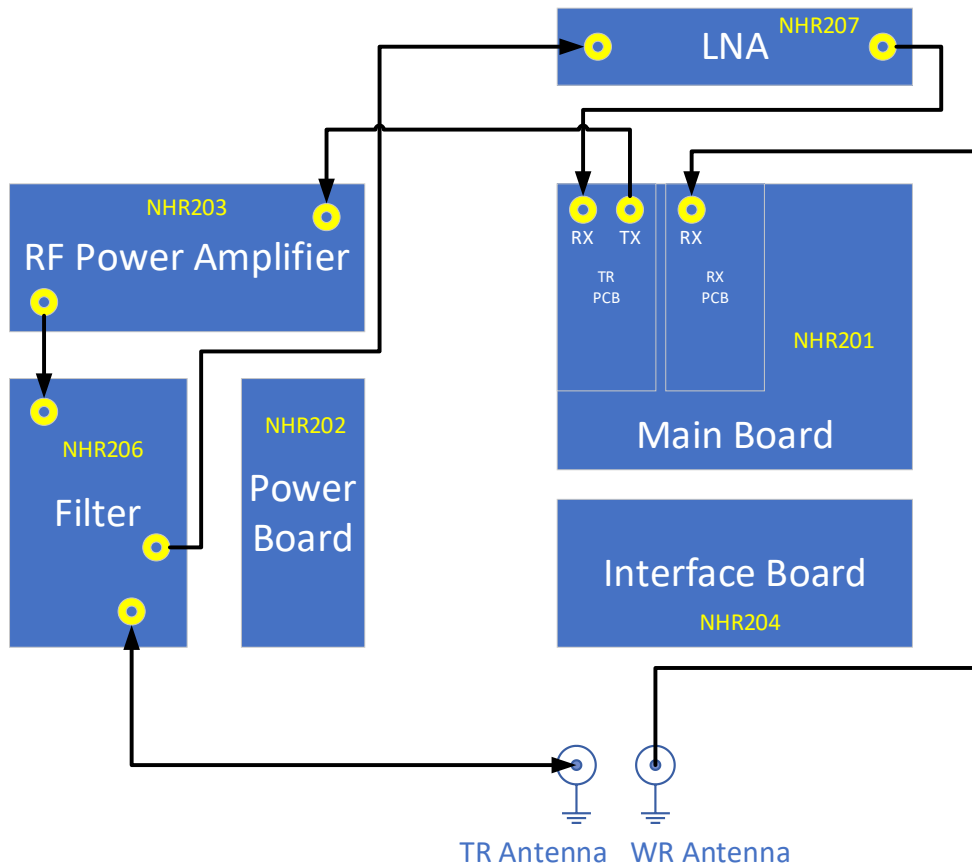


Fig 1-2 Block diagram of transceiver unit

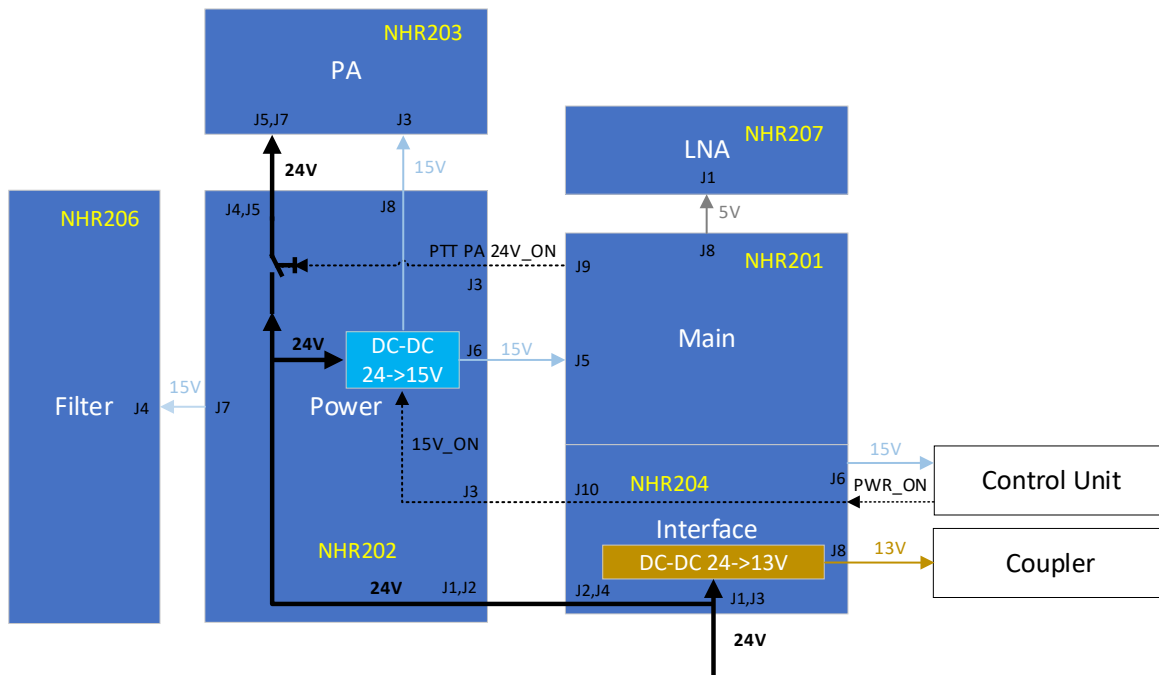


Fig 1-3 Power supply distribution diagram

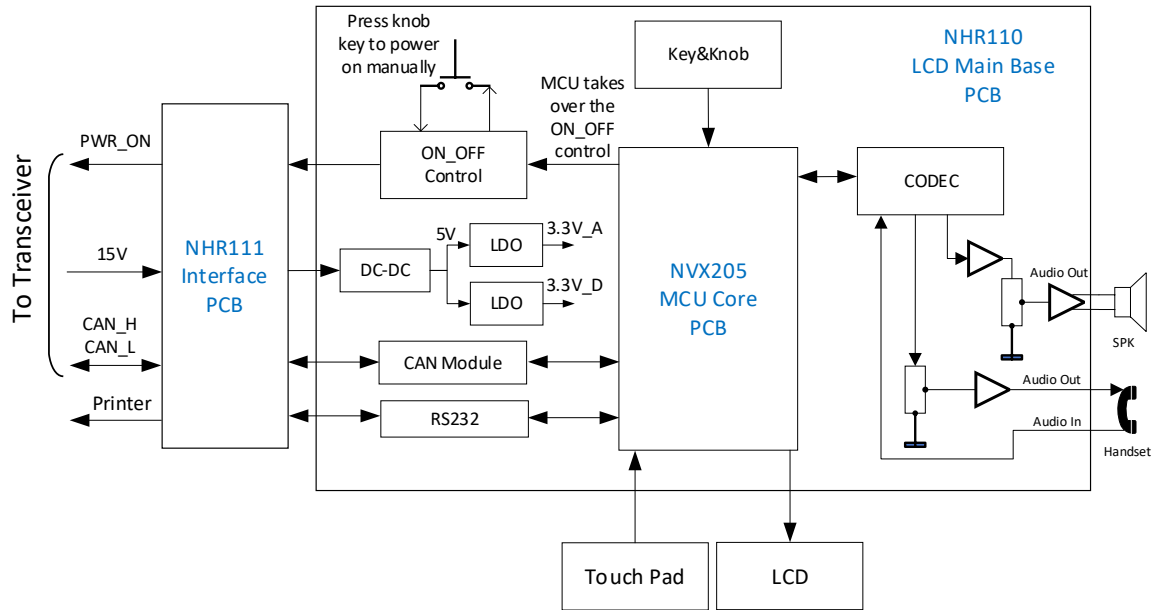


Fig 1-4 Functional diagram of the control unit

1.1 Hardware compatibility

Compatible	NHR201 Main board in transceiver unit	NHR204 Interface board in transceiver unit	Type of ATU	Remarks
Yes	Ver.3 2019.12.31	Ver.3 2019.12.28 Ver.4 2020.8.10	2-wire type	
Yes	Ver.5 2021.1.27 Ver.6 2022.3.24	Ver.4 2021.1.27 Ver.9 2023.7.20	3-wire type	
Yes	Ver.7 2023.9.22 Ver.9 2024.12.20	Ver.10 2023.9.22 Ver.12 2024.8.13	3-wire type	new internal cable for replacing the older version

Compatible	NHR202 Power board in transceiver unit	NHR110 Interface PCB in control unit	Remark
Yes	Ver.3 2019.12.25 Ver.5 2022.2.22	Ver.6 2020.1.8 Ver.8 2021.11.15	Please take photos of NHR202 Ver.4 and Ver.5, and send them to NSR for technical instruction before replacing.
Yes	Ver.6 2024.1.3 Ver.7 2024.8.12	Ver.10 2023.8.28 Ver.11 2024.2.1	

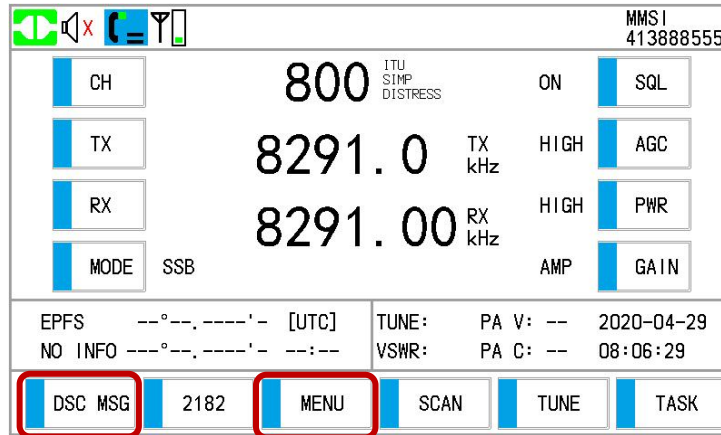
1.2 Software compatibility

Compatible	Control Unit APP	Transceiver CTRL
Yes	V1.22 20240712 or before	V1.15 20240712 or before
Yes	V1.23 20241112 or newer	V1.17 20241120 or newer

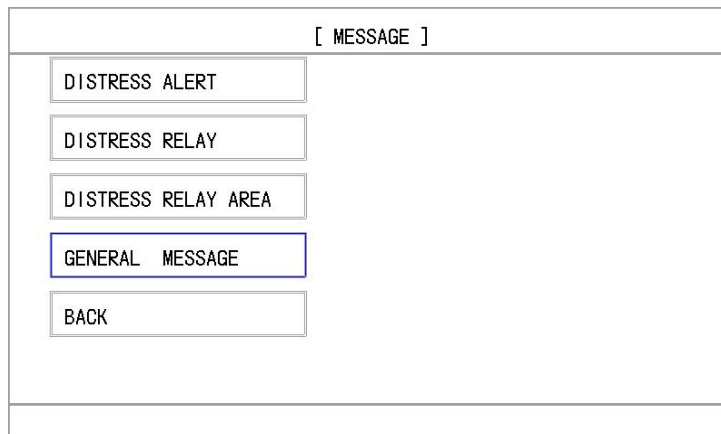
Note: If the firmware version of the control unit APP is before V1.18, it should be upgraded to V1.22.

2. MAINTENANCE

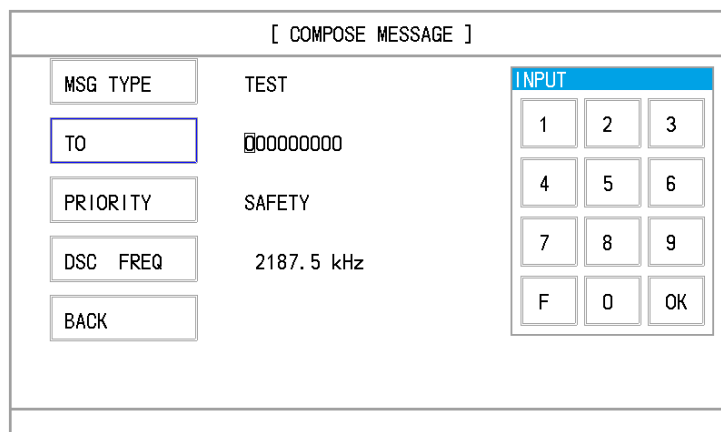
2.1 Steps to send DSC test call



- 1) Click **[DSC MSG]**, or click **[MENU]** and choose **[DSC] – [MESSAGE]**, then click **[GENERAL MESSAGE]** in **[MESSAGE]**.



- 2) Click **[MSG TYPE]** or rotate the **PUSH TO ENTER** knob to select **[MSG TYPE]**, then push the knob, select **[TEST]**.
- 3) Click **[TO]**, enter the MMSI where to send the test call in **[INPUT]**, then click **OK** to confirm.



[COMPOSE MESSAGE]	
MSG TYPE	TEST
TO	413888666
PRIORITY	SAFETY
DSC FREQ	2187.5 kHz
BACK	
CALL	

4) Click [CALL] to send the test call. The screen changes as below.

[TX MESSAGE-TEST]	
PRIORITY	:SAFETY
TO	:413888666
DSC FREQ	:TX 2187.5kHz RX 2187.5kHz
[SENDING]	ELAPSED :00:00:02
TLX TX: 2187.5 RX: 2187.5 kHz [SELECT]	
DSC MSG	2182
MENU	SCAN
PRINT	OPTION

5) After the call has been sent, the [WAIT ACK] screen appears as below. The elapsed time since sending the call is displayed.

[TX MESSAGE-TEST]	
PRIORITY	:SAFETY
TO	:413888666
DSC FREQ	:TX 2187.5kHz RX 2187.5kHz
[WAIT ACK]	ELAPSED :00:00:22
TLX TX: 2187.5 RX: 2187.5 kHz [SELECT]	
DSC MSG	2182
MENU	SCAN
PRINT	OPTION

6) When you receive an acknowledge message, the audio alarm sounds and a pop-up message appears.

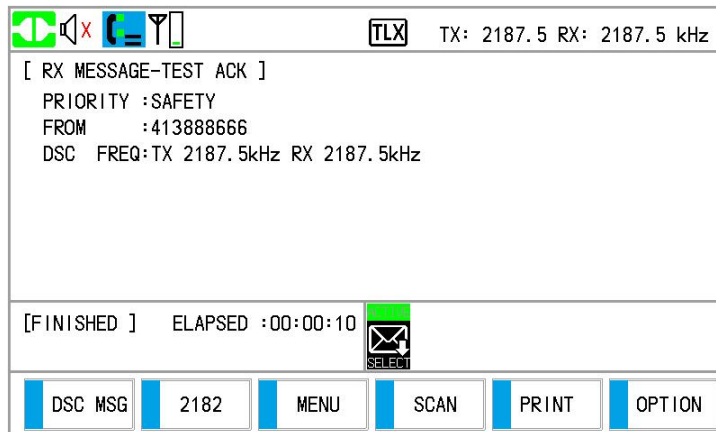
[RX MESSAGE-TEST ACK]	
PRIORITY	:SAFETY
FROM	:413888666
DSC FREQ	:TX 2187.5kHz RX 2187.5kHz
[FINISHED]	ELAPSED :00:00:05
TLX TX: 2187.5 RX: 2187.5 kHz [SELECT]	
DSC MSG	2182
MENU	SCAN
PRINT	OPTION

DSC INFO

RECEIVED A DSC MESSAGE.
TEST ACK

CLICK

7) Click **CLICK** to silence the audio alarm and erase the pop-up message.



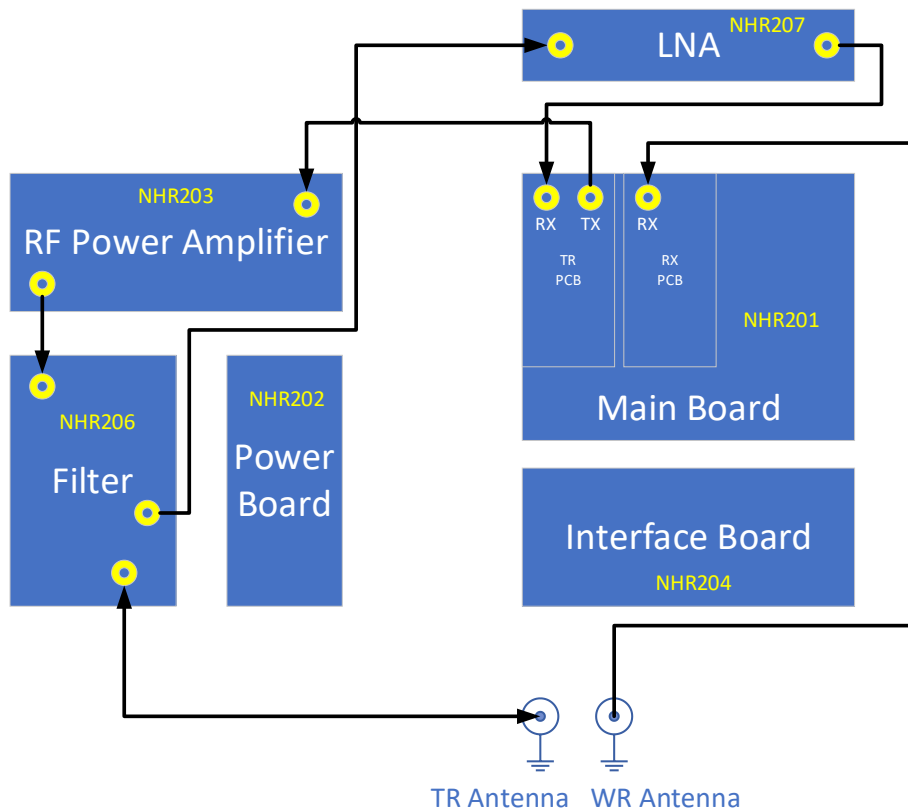
8) Click **OPTION**, select **Quit** to go back to the SSB screen.

Note: Due to location, time, weather, and other factors, HF radio propagation is significantly affected by the ionosphere. This may cause unstable results in DSC test calls - sometimes calls succeed while other times fail, and the same occurs on different channels.

2.2 Test receiving with GMDSS tester

2.2.1 General

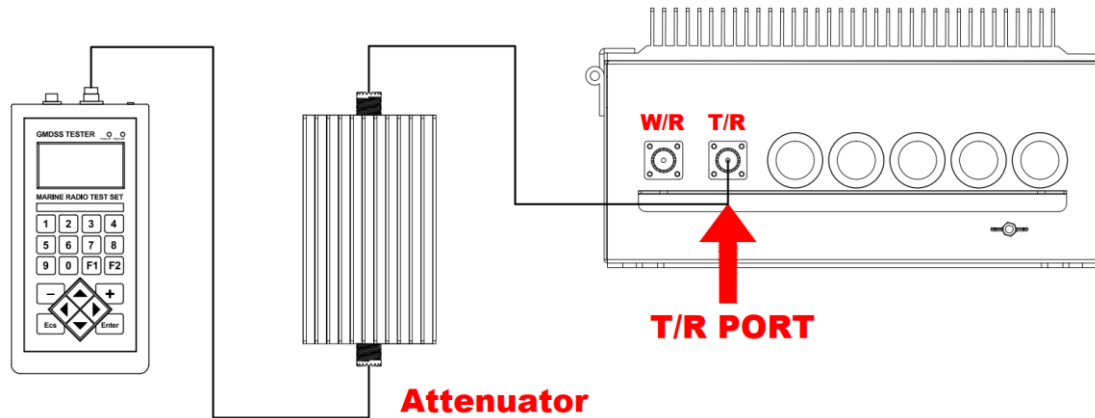
The TR board uses SDR technology, which samples the SSB and DSC signal from the same path, then processes the signal at the FPGA by software. So, if DSC receiving is OK, the SSB receiving should be OK as well.



2.2.2 Test by using attenuator

Please follow the steps below to test.

- 1) Connect the GMDSS tester to the TR port with a 200W 40db attenuator.



- 2) Operate on the GMDSS tester:

Select Safety message, 4207.5kHz.

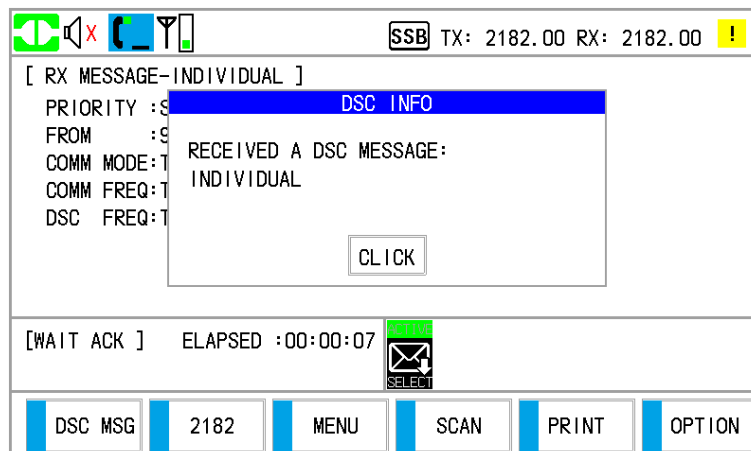
“To” (To MMSI) should be the vessel’s MMSI.

The Pow value should be in the range of -75dBm to -60dBm.

For example:

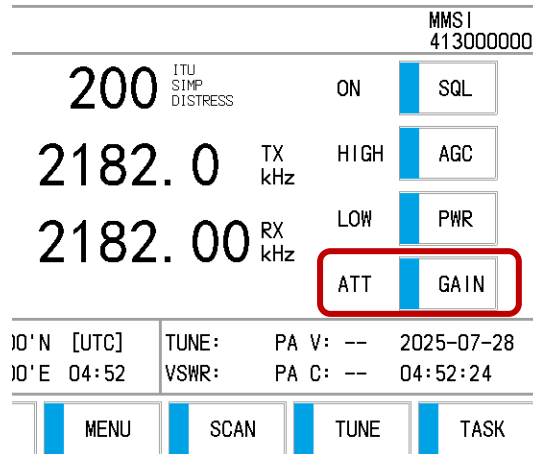
<p>= MF/HF: Send DSC = Select message:</p> <p style="text-align: center;">Distress Safety Routine Test Ack</p>	<p>= MF/HF: Send DSC = Safety message</p> <p style="text-align: center;">2187.5 kHz 4207.5 kHz 6312.0 kHz 8414.5 kHz 12577.0 kHz 16804.5 kHz</p>	<p>= MF/HF: Send DSC =</p> <p style="text-align: center;">To: 41300000 From: 99999999 Freq: 4207.5kHz Pow: -060 dBm</p> <p>Send - press Enter</p>
---	---	---

After “Send”, NHR-1500 can receive the DSC message as shown in the picture below.

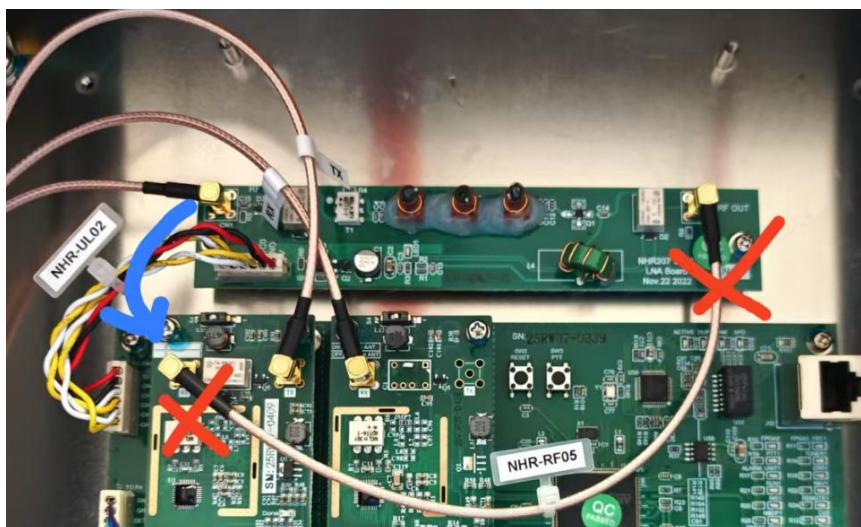
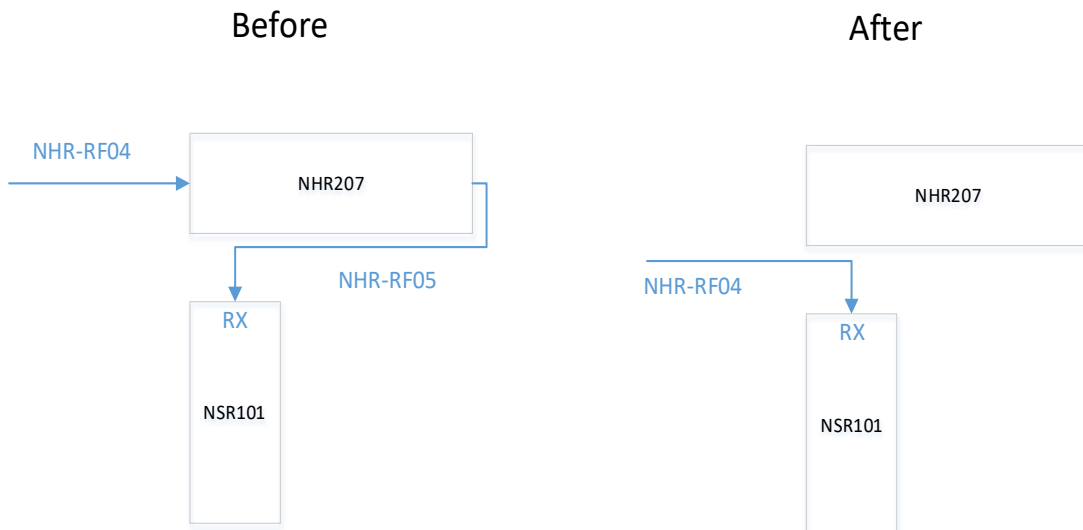


If DSC can be received within the range of -75dBm to -60dBm, the receiving at TR port is OK.

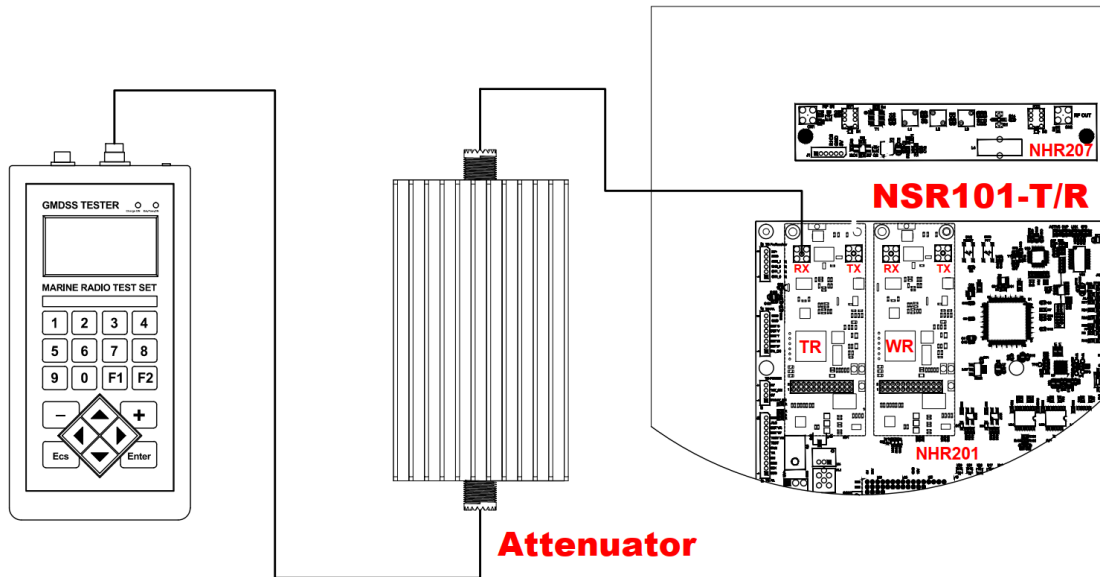
3) If Step 2 is not OK. Change GAIN to ATT, then repeat the test of Step 2.



4) If Step 3 is not OK, bypass the LNA board, then repeat the test of Step 2.



- 5) If Step 4 is not OK, connect the GMDSS tester to NSR101 TR board with a 200W 40db attenuator. Then repeat the test of Step 2.



If Step 5 is OK, the internal RF cable or NHR206 filter board should be faulty.
If Step 5 is not OK, the NSR101 TR board should be faulty.

2.2.3 Test by using antenna

- 1) There are three methods for the testing:

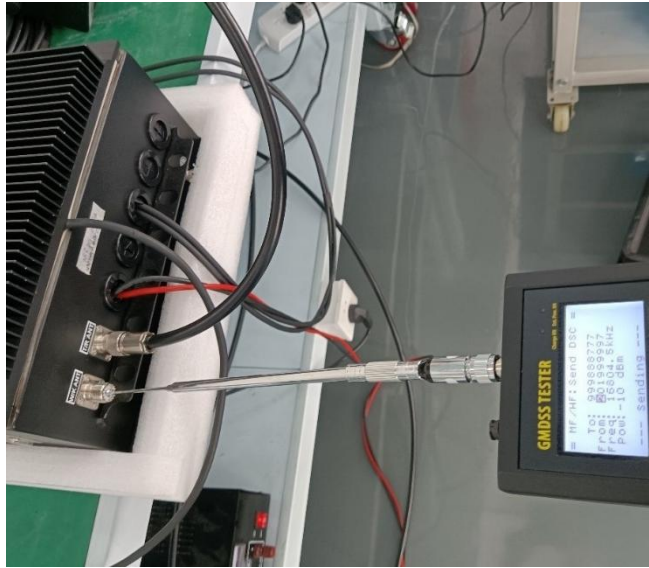
● **Method 1**

Insert a screwdriver into the TR ANT port as an antenna to receive the transmission from the GMDSS tester.



- **Method 2**

Touch the WK ANT port with the GMDSS tester's antenna.



- **Method 3**

Radiate RF signals to the TR antenna.



2) Operate on the GMDSS tester:

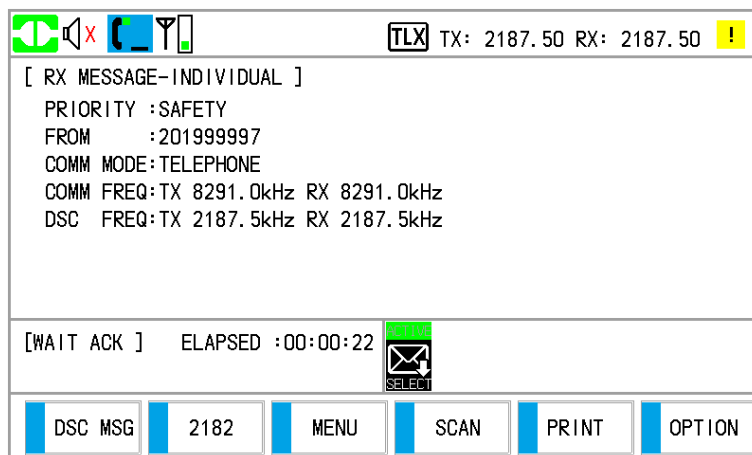
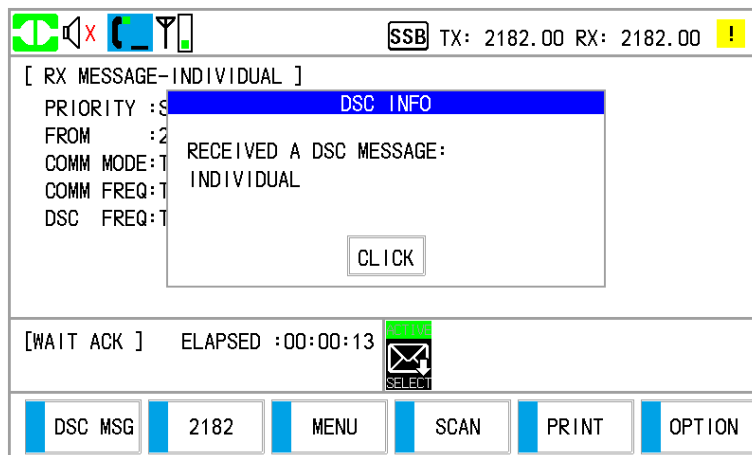
Select Safety message, and one frequency from the six distress frequencies.

“To” (To MMSI) should be the vessel’s MMSI.

For example:

<p>= MF/HF: Send DSC = Select message:</p> <p>Distress Safety Routine Test Ack</p>	<p>= MF/HF: Send DSC = Safety message</p> <p>2187.5 kHz 4207.5 kHz 6312.0 kHz 8414.5 kHz 12577.0 kHz 16804.5 kHz</p>	<p>= MF/HF: Send DSC =</p> <p>To: 413000000 From: 201999997 Freq: 4207.5kHz Pow: 00 dBm</p> <p>Send - press Enter</p>
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After “Send”, NHR-1500 can receive the DSC message as shown in the picture below.



2.3 Change MMSI

MMSI is saved in the control unit. If the control unit is replaced, MMSI needs to be configured.

[MAIN MENU]
<input style="width: 100%; height: 20px;" type="text" value="USER"/>
<input style="width: 100%; height: 20px;" type="text" value="DSC"/>
<input style="width: 100%; height: 20px;" type="text" value="SYSTEM"/>
<input style="width: 100%; height: 20px;" type="text" value="DIAGNOSTICS"/>
<input style="width: 100%; height: 20px;" type="text" value="SERVICE"/>
<input style="width: 100%; height: 20px;" type="text" value="EXIT MENU"/>

Enter [SERVICE] menu. The password is required. Please contact NSR authorized agent for the password.

[SERVICE]
<input style="width: 100%; height: 20px;" type="text" value="ADVANCED"/>
<input style="width: 100%; height: 20px;" type="text" value="COM MONITOR"/>
<input style="width: 100%; height: 20px;" type="text" value="FACTORY SET"/>
<input style="width: 100%; height: 20px;" type="text" value="REBOOT"/>
<input style="width: 100%; height: 20px;" type="text" value="BACK"/>

Enter [FACTORY SET] menu.

[FACTORY SET]	
<input style="width: 100%; height: 20px;" type="text" value="SYSTEM SETTING"/>	<input style="width: 100%; height: 20px;" type="text" value="MMSI LOCK"/>
<input style="width: 100%; height: 20px;" type="text" value="ADDRESS LIST"/>	<input style="width: 100%; height: 20px;" type="text" value="CHANNEL LIST"/>
<input style="width: 100%; height: 20px;" type="text" value="DSC LOG"/>	<input style="width: 100%; height: 20px;" type="text" value="ALERT LOG"/>
<input style="width: 100%; height: 20px;" type="text" value="TOTAL DATA"/>	<input style="width: 100%; height: 20px;" type="text" value="BACK"/>

CONFIRM

Setting or Data will be restored factory set?

Click [MMSI LOCK]. Then CONFIRM “YES”.

[FACTORY SET]	
<input style="width: 100%; height: 20px;" type="text" value="SYSTEM SETTING"/>	<input style="width: 100%; height: 20px;" type="text" value="MMSI LOCK"/>
<input style="width: 100%; height: 20px;" type="text" value="ADDRESS LIST"/>	<input style="width: 100%; height: 20px;" type="text" value="CHANNEL LIST"/>
<input style="width: 100%; height: 20px;" type="text" value="DSC LOG"/>	<input style="width: 100%; height: 20px;" type="text" value="ALERT LOG"/>
<input style="width: 100%; height: 20px;" type="text" value="TOTAL DATA"/>	<input style="width: 100%; height: 20px;" type="text" value="BACK"/>

Setting or Data will be restored factory set?

Click [BACK], then the system will restart automatically.

[MAIN MENU]

USER

DSC

SYSTEM

DIAGNOSTICS

SERVICE

EXIT MENU

Enter [DSC] menu.

[DSC]

MESSAGE

ADDRESS

SCAN SETTING

ACK SETTING

MMSI SETTING

BACK

Enter [MMSI SETTING] menu.

[MMSI SETTING]

MMSI 98765432

SET

BACK

INPUT		
1	2	3
4	5	6
7	8	9
F	0	OK

Set new MMSI, then click [OK].

[MMSI SETTING]

MMSI 987654321

SET

BACK

CONFIRM

NO

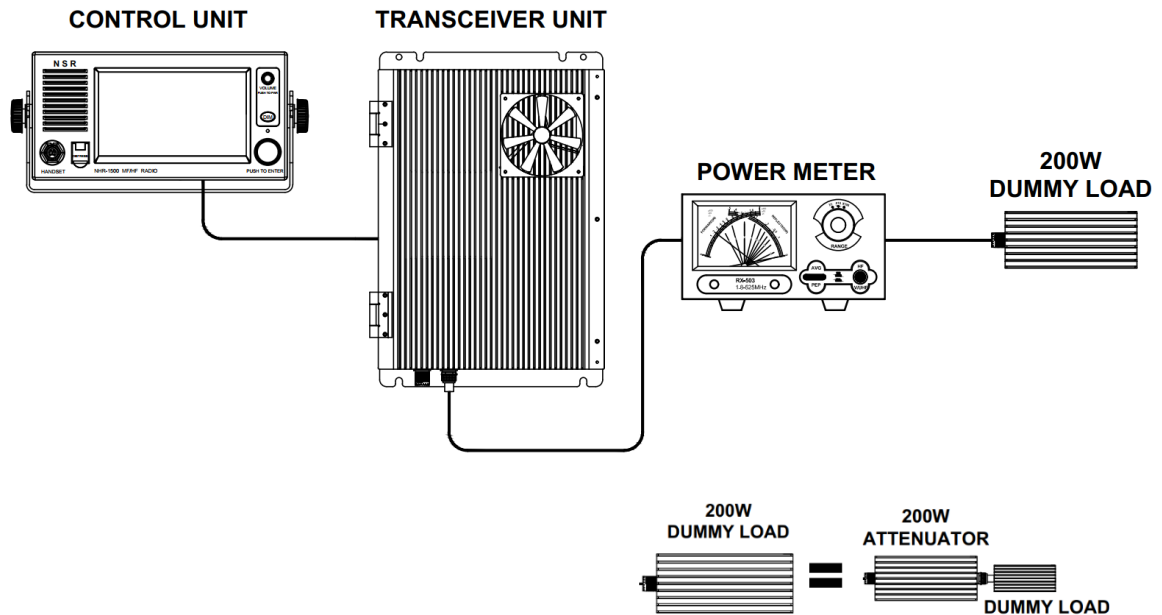
YES

Click [SET], then CONFIRM "YES".

2.4 Calibrate RF output power

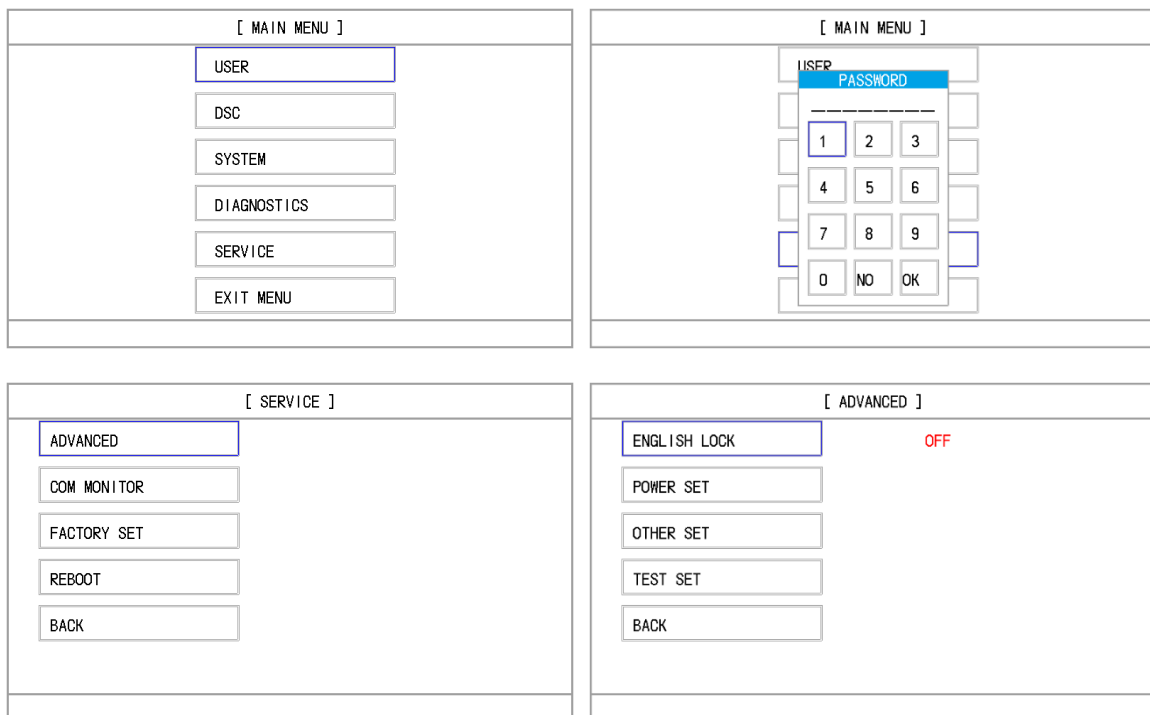
If NHR206 filer board or NHR201 main board is replaced by a new one, the RF output power should be calibrated.

2.4.1 Connection

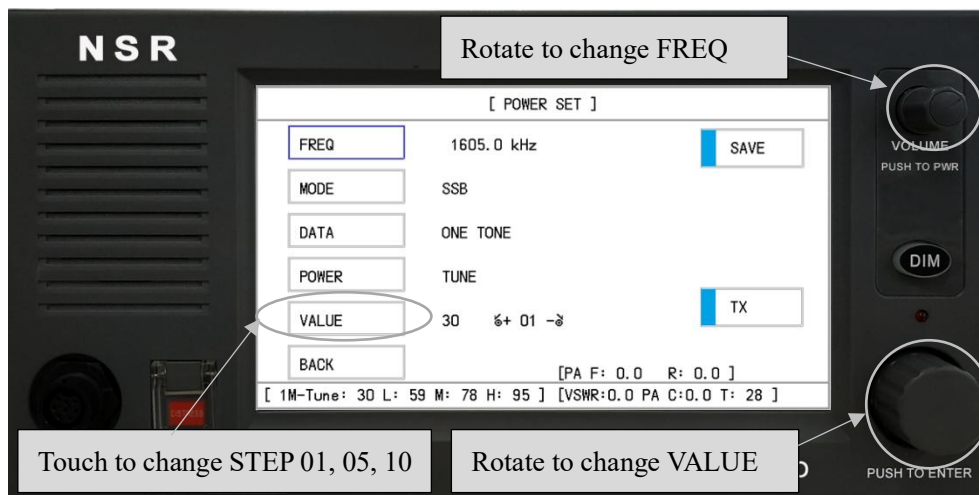
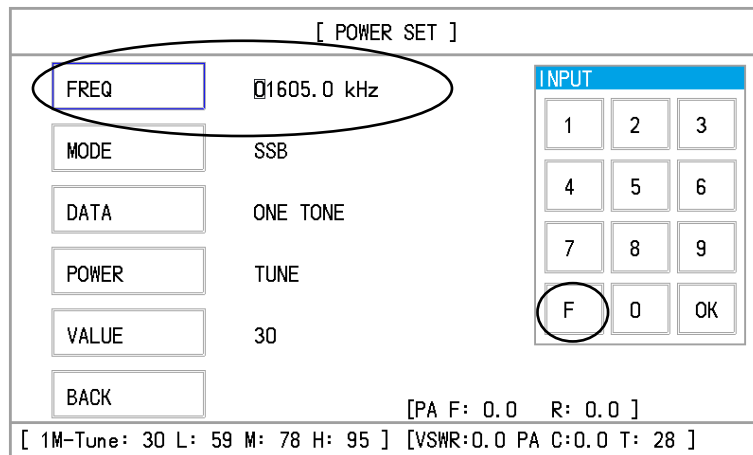
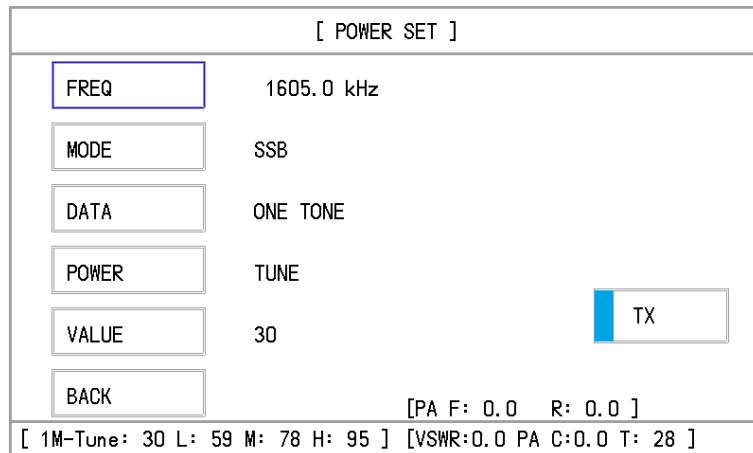


Note: The 200W dummy load can be replaced by a 200W/40dB attenuator and a 20W dummy load.

2.4.2 Operation



Enter [POWER SET] menu from [MAIN MENU]-[ADVANCED]-[POWER SET]. The password is required. Please contact NSR authorized agent for the password.



Touch "FREQ", then touch "F" to change the SSB distress frequency 2182kHz, 4125kHz, 6215kHz, 8291kHz, 12290kHz, 16420kHz, and the DSC distress frequency 2187.5kHz, 4207.5kHz, 6312kHz, 8414.5kHz, 12577kHz, 16804.5kHz, and the NBDP distress frequency (at DSC mode) 2174.5kHz, 4177.5kHz, 6288kHz, 8376.5kHz, 12520kHz, 16695kHz.

Or type to enter any frequency. (Very slow)

To speed up the calibration for normal frequency, use the small knob. The step is 1000kHz.

Touch “TX”, then check at power meter and ammeter.

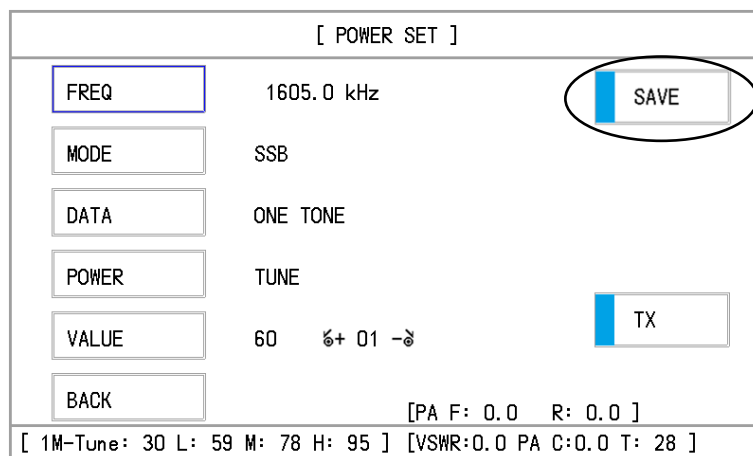
Rotate the big knob to change the power level.

Too big current is dangerous to the PA.

For POWER HIGH level, the current is around 10A to 18A. If the current is greater than 18A, please decrease the calibration value. Even if the power output does not reach the target.



After calibration, don't forget to **SAVE** the value. The calibration value is saved at the NHR201 PCB inside the transceiver unit.



Note:

PA F: Forward voltage.

PA R: Reverse voltage.

2.4.3 Calibration Table

MODE: SSB DATA: ONE TONE

Frequency	Tune	Low	Mid	High
2182kHz				
4125kHz				
6215kHz				
8291kHz				
12290kHz				
16420kHz				
1605kHz				
2605kHz				
3605kHz				
4605kHz				
5605kHz				
6605kHz				
7605kHz				
8605kHz				150W
9605kHz				
10605kHz	20W	50W	120W	
11605kHz				
12605kHz				
13605kHz				
14605kHz				
15605kHz				
16605kHz				
17605kHz				
18605kHz				
19605kHz				
20605kHz				
21605kHz				
22605kHz				120W
24605kHz				120W
25605kHz				120W
26605kHz				120W
27500kHz				120W

MODE: DSC DATA: ONLY B

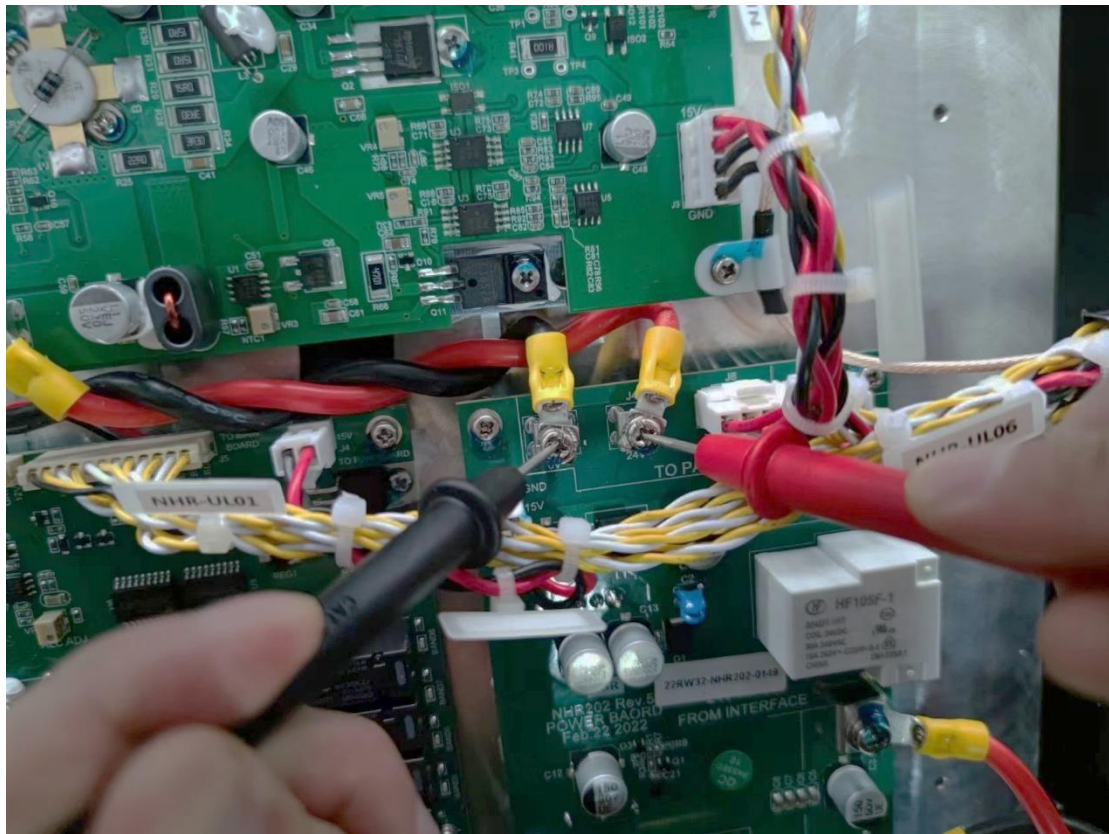
Frequency	Tune	Low	Mid	High
2187.5kHz				
4207.5kHz				
6312kHz				
8414.5kHz				
12577kHz				
16804.5kHz				
2174.5kHz				
4177.5kHz				
6288kHz				
8376.5kHz				
12520kHz				
16695kHz				
1605kHz				
2605kHz				
3605kHz				
4605kHz				
5605kHz				150W
6605kHz				
7605kHz	20W	50W	120W	
8605kHz				
9605kHz				
10605kHz				
11605kHz				
12605kHz				
13605kHz				
14605kHz				
15605kHz				
16605kHz				
17605kHz				
18605kHz				
19605kHz				
20605kHz				
21605kHz				
22605kHz				120W
24605kHz				120W
25605kHz				120W
26605kHz				120W
27500kHz				120W

2.5 Steps to check transmission power

When the transmitter has no power output when PTT is pressed, please check the power supply first. If the power supply is OK but the issue still exists, please follow the steps below to check.

1) Measure the PA voltage.

Measure the voltage at NHR202 PCB, from the connector “TO PA”.

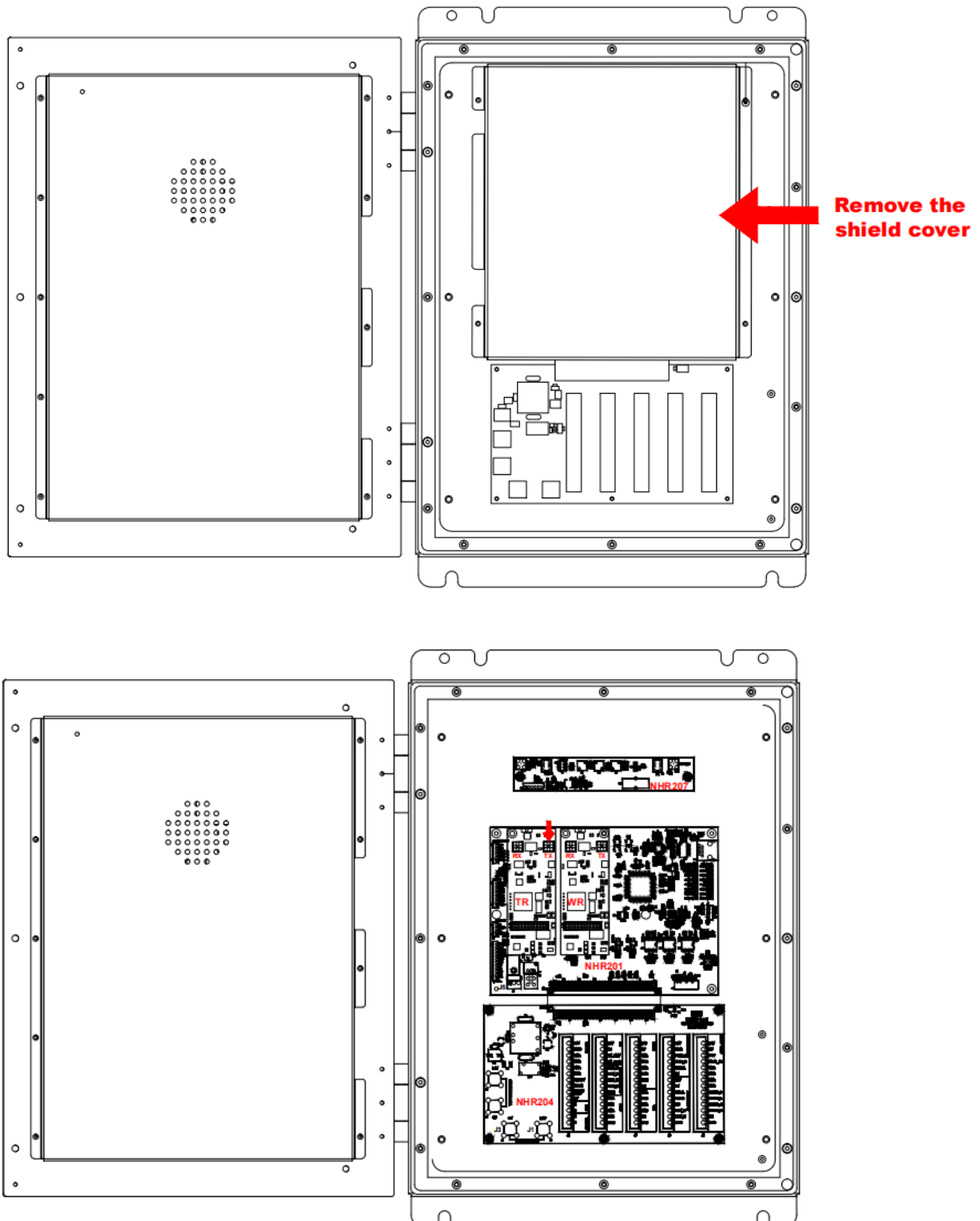


Press “TUNE” on the control unit. The voltage to PA should be 24V DC. If no 24V at PA power supply, the ISO1 at NHR201 PCB needs replacing.

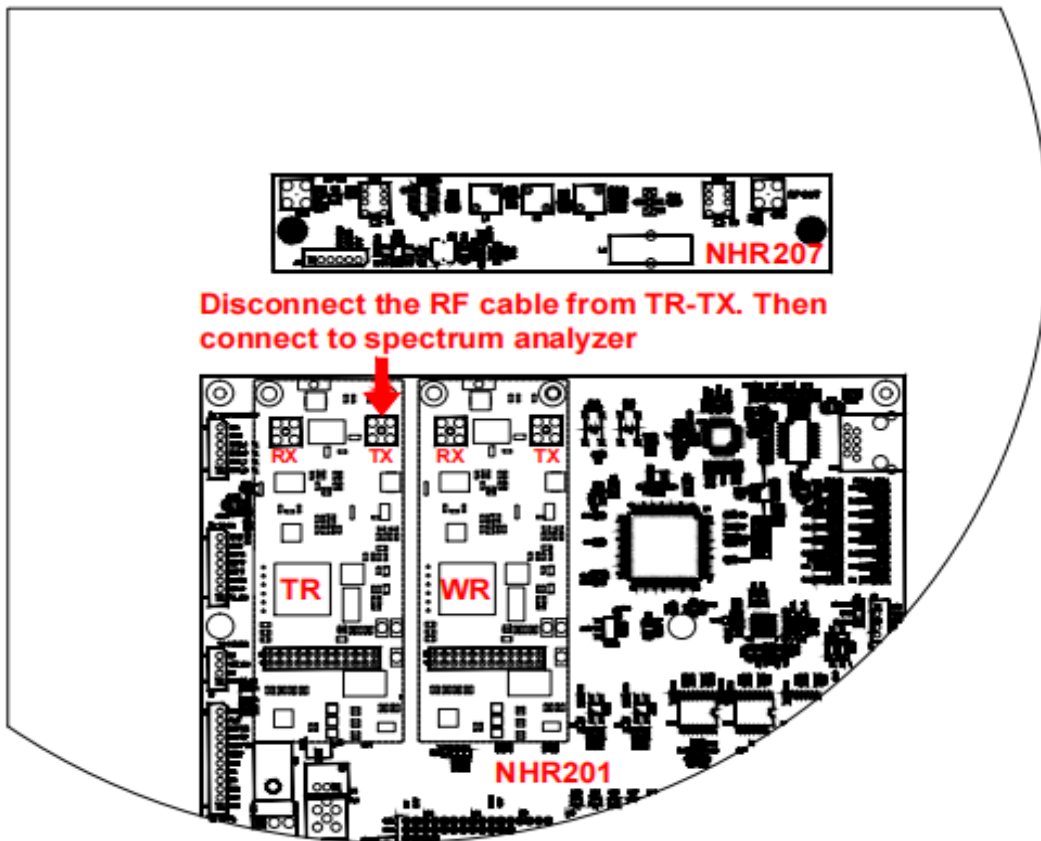


2) If 24V is OK, check as follows.

Remove the shield cover. Find the TR board on NHR201.



Disconnect the RF cable from the TR board - TX, then connect to the spectrum analyzer. If the spectrum analyzer is not available, an oscilloscope may be used instead.

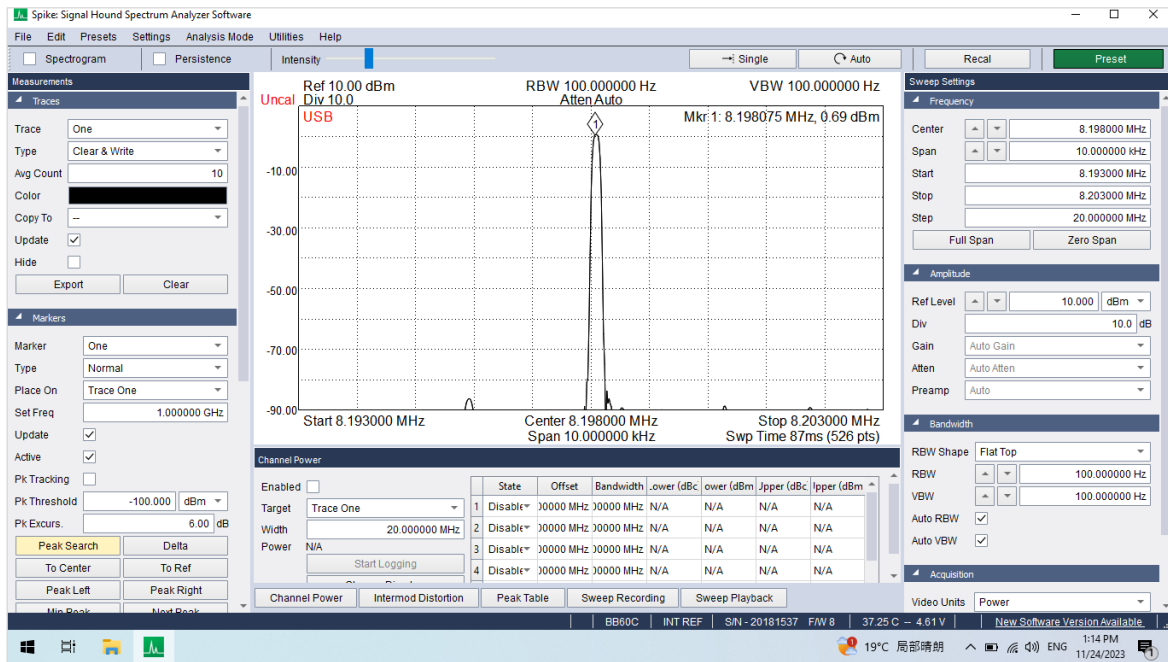


Enter [MENU] - [SERVICE] - [ADVANCED] - [POWER SET] with password.

Set the [FREQ] about 8MHz, and set [MODE] as DSC, and set [POWER] as TUNE, and then click [TX].

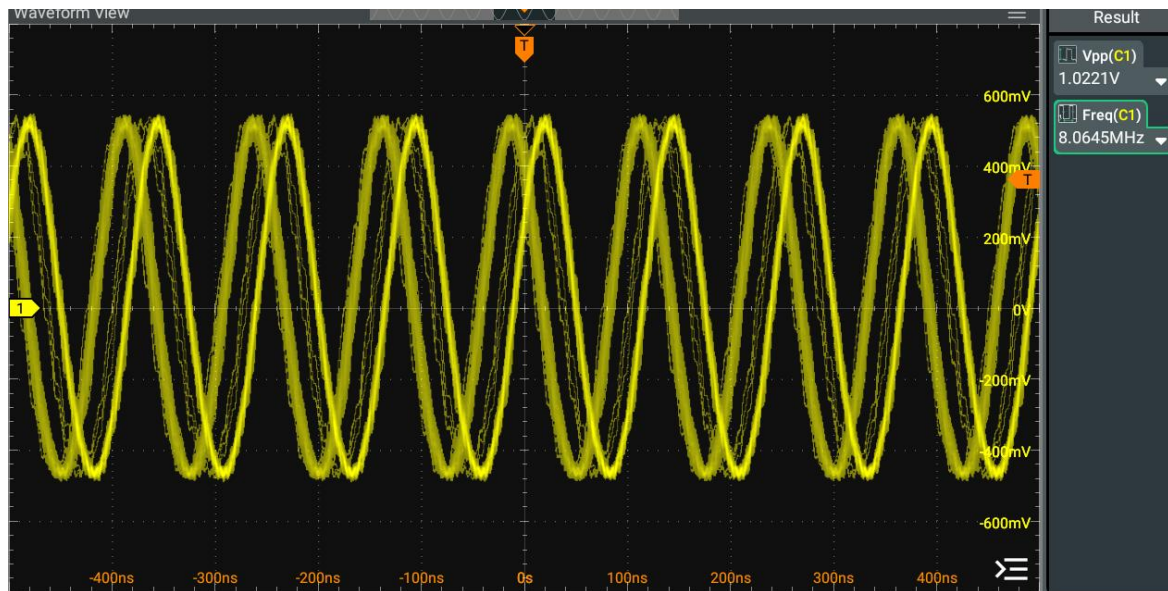
[POWER SET]	
FREQ	1605.0 kHz 1
MODE	SSB 2
DATA	ONE TONE
POWER	TUNE 3
VALUE	30
BACK	[TX] 4
[PA F: 0.0 R: 0.0]	
[1M-Tune: 30 L: 59 M: 78 H: 95] [VSWR:0.0 PA C:0.0 T: 28]	

If the TR board is OK, the waveform will be shown on the spectrum analyzer as below.

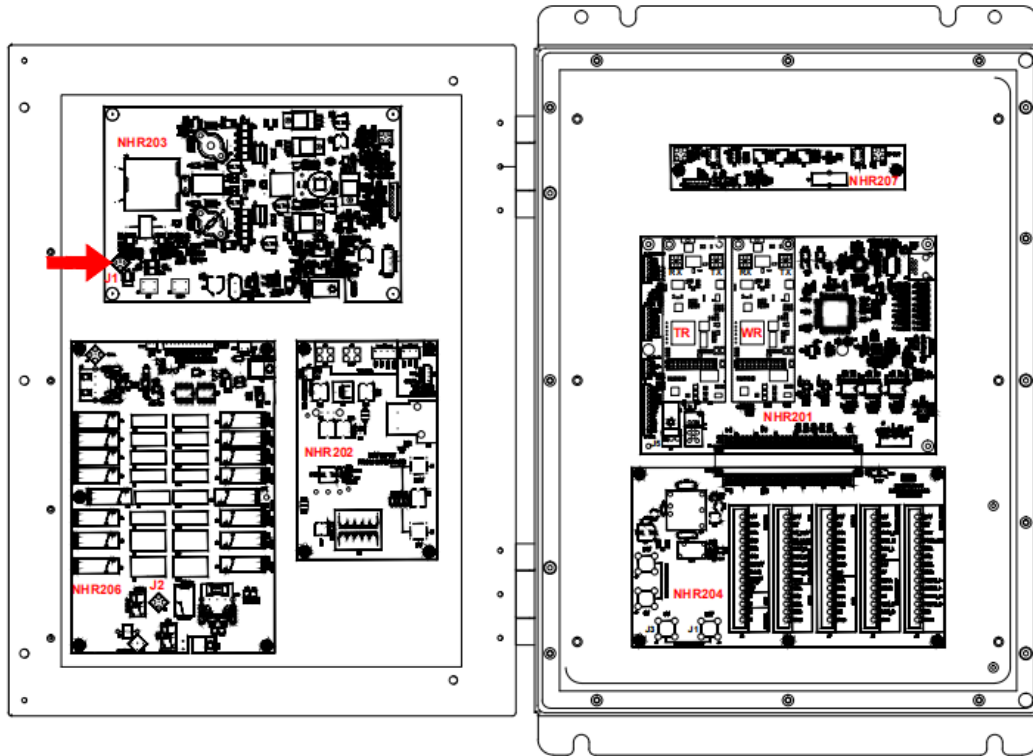


The amplitude is about 0dBm. If no power amplitude on the spectrum analyzer, maybe the T/R board was damaged. If it's OK, check the next point.

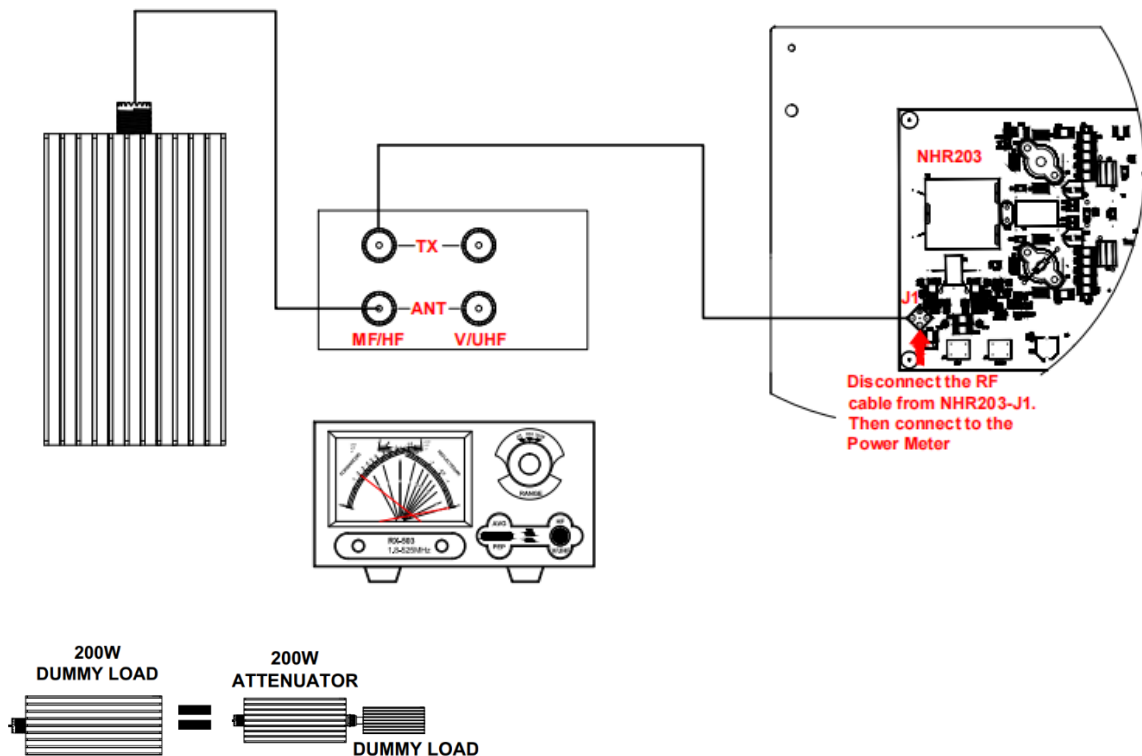
TX output at the TR board, measured at the oscilloscope. The Vpp should be around 1V, and Freq should be around 8MHz.



- 3) Stop [TX] on the POWER SET screen. Disconnect from the spectrum analyzer and turn back to connect the RF cable. Remove the shield cover.

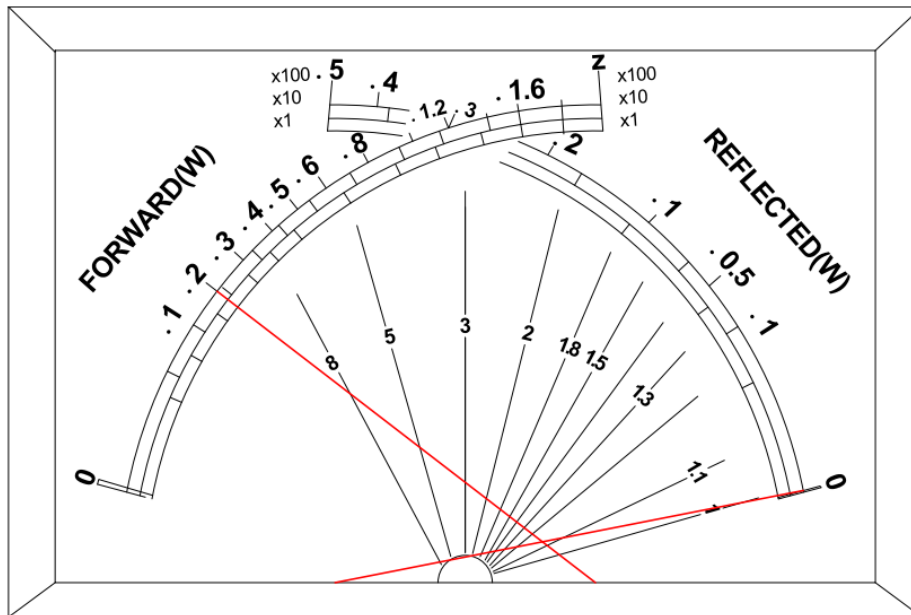


Find J1 on NHR203, and disconnect the RF cable. Then connect to the power meter and dummy load. Set the power meter as **【HF】** and choose **【PEP】**, set the range as **【x100】**.

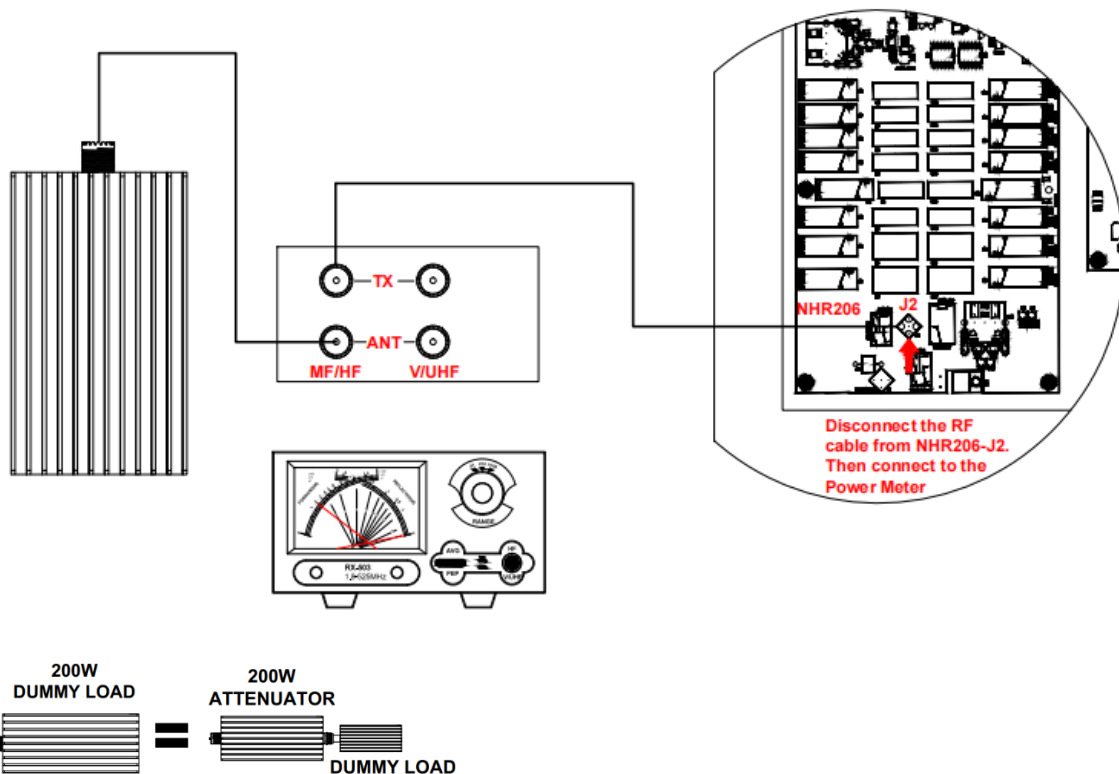


Note: the 200W dummy load can be replaced by a 200W/40dB attenuator and a 20W dummy load.

Click [TX] on the POWER SET screen. If the NHR203 is OK, the power meter shows about 20W. If no power output, maybe NHR203 was damaged. If NHR203 is OK, disconnect the power meter and turn back to connect the RF cable. Stop [TX] on the POWER SET screen and check the next point.

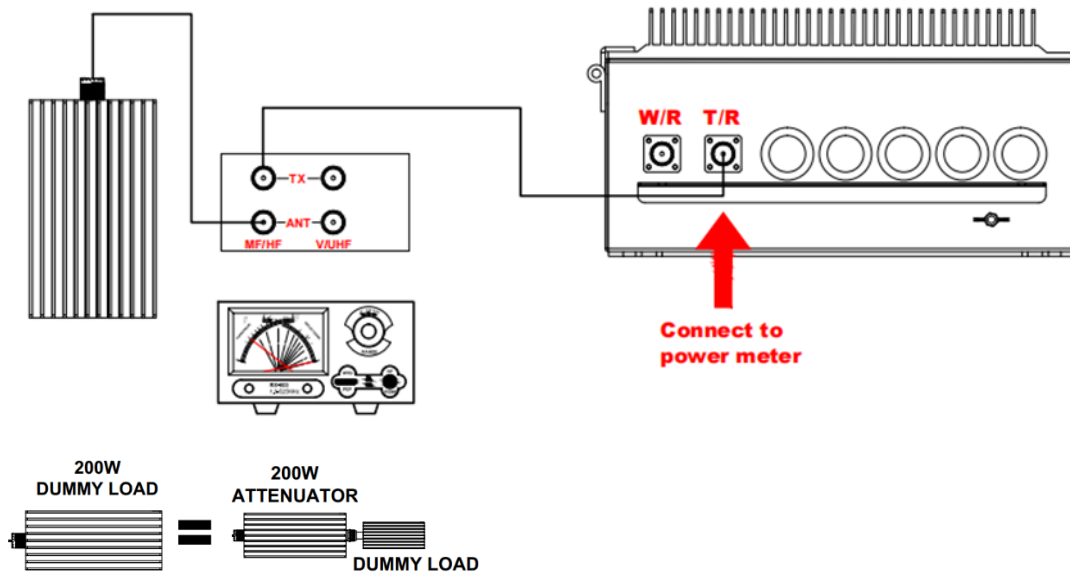


- Find J2 on NHR206 and connect it to the power meter, then click [TX] on the POWER SET screen. If the NHR206 is also OK, the power meter shows about 20W. If no power output, maybe NHR206 was damaged.



Note: The 200W dummy load can be replaced by a 200W/40dB attenuator and a 20W dummy load.

- 5) Stop [TX] on the POWER SET screen. Turn back the RF cable on J2. Connect the power meter to T/R port on the transmitter, then click [TX] on the POWER SET screen. Check the power meter, it should be 20W. If no power output, check the RF cable between the NHR206 J2 and to T/R port on the transmitter.



Note: The 200W dummy load can be replaced by a 200W/40dB attenuator and a 20W dummy load.

2.6 Grounding of ATU (antenna coupler unit)

Since April 2025, an upgraded grounding strip has been supplied with ATU, which is attached with an iron plate. Please weld the plate to the hull for better grounding.



3. TROUBLESHOOTING

In the process of debugging, operating the unit would have an alert under the state of fault. Click [USER] on the [MAIN MENU] screen. The [USER MANAGER] menu appears.

[USER]

CHANNEL LIST

ALERT LIST

USER TEST

DSC LOG

BACK

Select [ALERT LIST] to show the following menu.

[ALERT LIST]

ID	TIME	ALERT-TITLE	1 / 10	
> 3062	07:11	SELFTEST:FAULT		VIEW
3115	07:11	ANTENNA:FAILURE		MUTE
3008	07:11	TX POWER:FAILURE		ACK
3122	07:11	DISTRESS:RX		LOG
3062	07:13	GENERAL:FAULT		TOP
! 3009	07:11	PA:OVERHEATING		BACK
! 3123	07:11	SAFETY:RX		
! 3009	07:11	NBDP:LOST		

TIME:UTC

[VIEW]: Check the details of the alert selected.

[MUTE]: Mute the alert.

[ACK]: Acknowledge the alert.

[LOG]: Check the alert history.

For example, click [VIEW] to show the following menu.

[ALERT VIEW]

ID

3122 : 310

CATEGORY

A

PRIORITY

WARNING

STATE

ACTIVE-UNACKNOWLEDGED

TEXT

DISTRESS:RX
Receipt of distress call

BACK

RESET

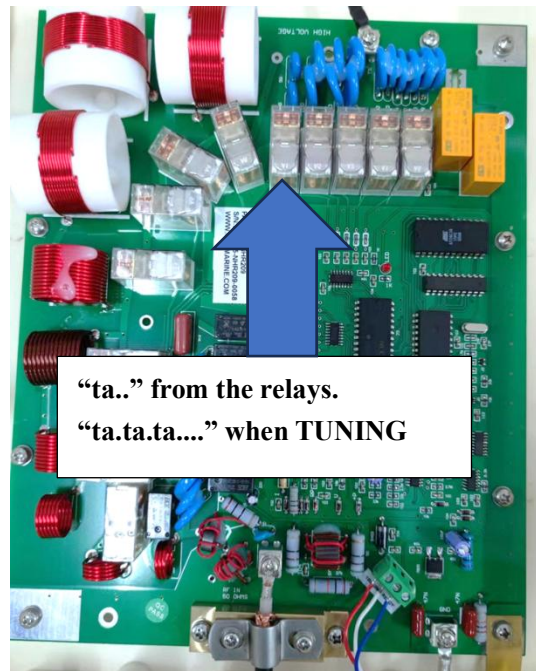
Note: [RESET] is only used for DISTRESS RX alert reset.

The table below shows error messages, their meanings, and remedies, for your reference.

Alert ID Reference	Error Message	Additional Description	Meaning & Remedy
3122	DISTRESS: RX	Receipt of distress call.	Check DSC Task.
3008	TX POWER: FAILURE	TRANSCEIVER FAIL	Not transmitting. Check equipment status.
3062	GENERAL: FAULT	HW error.	Check Version menu, contact the manufacturer.
		HW error: FLASH.	Flash chip failure. Check Version menu, contact the manufacturer.
		HW error: RTC.	RTC circuit failure. Check Version menu, contact the manufacturer.
		HW error: AUDIO.	Audio chip failure (excluding the audio PA and volume circuit). Check Version menu, contact the manufacturer.
		HW error: NET.	Network chip failure. Check Version menu, contact the manufacturer.
3062	SELFTTEST: FAULT	Built in self test failure.	Check failure information, contact manufacturer.
3016	POSITION: LOST	No position data received.	Position data is not updated for 15 minutes. Check external GNSS data input or manual enter the position.
3115	ANTENNA: FAILURE	VSWR high.	VSWR exceeds limit. Check Antenna.
		VSWR high_In Tuning.	VSWR exceeds limit in turning. Check Antenna.
		VSWR high_LastTime TuneError.	VSWR is high and also exceeded limit in previous turning. Check Antenna.
		VSWR high_LastTime TuneOK.	VSWR is high but was OK in previous turning. Check Antenna.
3019	MMSI: WRONG	Check MMSI setting.	MMSI is not set. Enter MMSI of own ship.
3009	CONTROL: LOST	Check control unit.	Lost Communication interface. Check equipment, contact the manufacturer.
3009	TRANSCEIVER: LOST	Check transceiver.	Internal interface failure. Check equipment, contact the manufacturer.
3009	CORE: LOST	Check transceiver.	Lost Core interface. Check equipment, contact the manufacturer.
3009	NBDP: LOST	Check NBDP.	Lost NBDP interface. Check equipment, contact the manufacturer.
3009	PA: OVERHEATING	Reduced Transmission power.	PA temperature is too high. Test after the amplifier cools down.
3023	AC POWER FAIL	Check AC power supply.	AC Power input fail. Check equipment, contact the manufacturer.

3.1 TUNE ERR

Disconnect and then connect the power cable, the relays of ATU make the short “ta..” sound.



If no “ta..” sound when ATU is powered ON, check the power supply to the coupler at NHR204 interface PCB (transceiver unit).

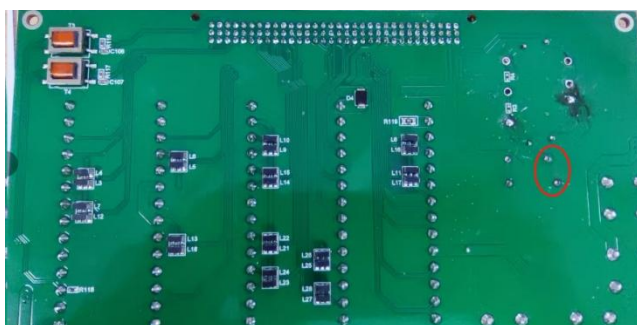
Measure the voltage between 15V and GND, which should be around 12-15V.

If no 12-15V:

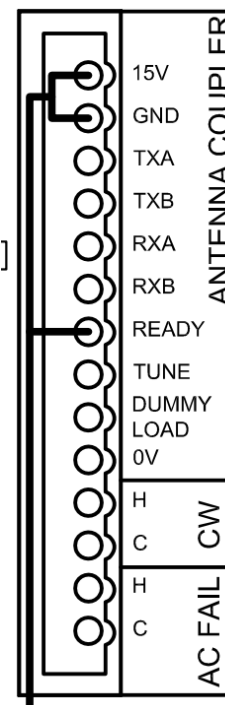
- 1) Change NHR204 PCB. Make sure the new NHR204 PCB has the same version.
- 2) Or check the NHR204 PCB. Try to repair.

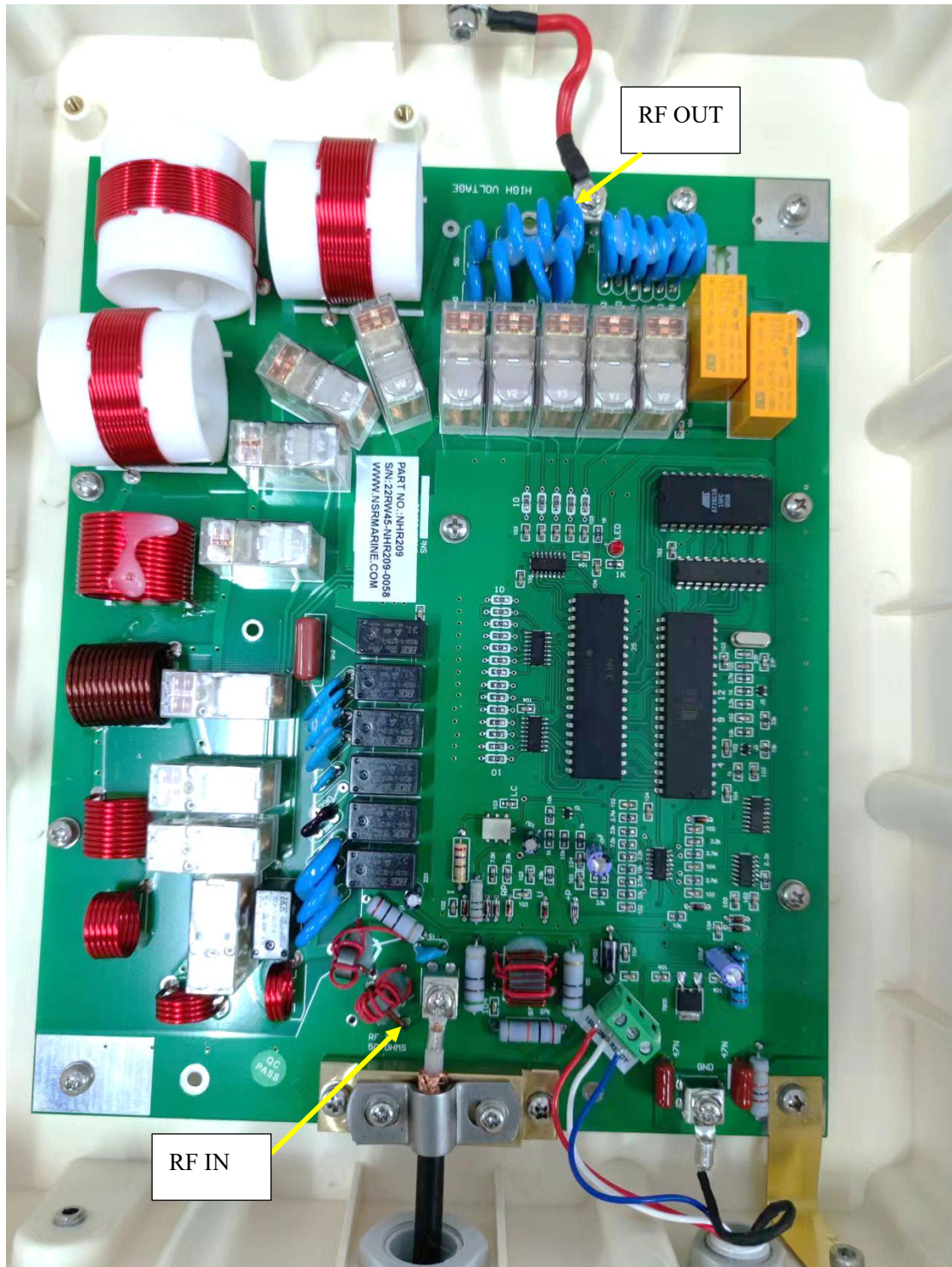


Check the FUSE F1 first, which is on the front side of NHR204 PCB.



If the FUSE is OK, try to short connect the two points on the back side of NHR204 PCB.





Confirm that there are no burnt components.

Confirm RF power input and output are normal.

Tune at every band. The ATU starts to TUNE (make ta..ta..ta.. sound), then stops and LED of ATU will be ON, which means TUNE OK.



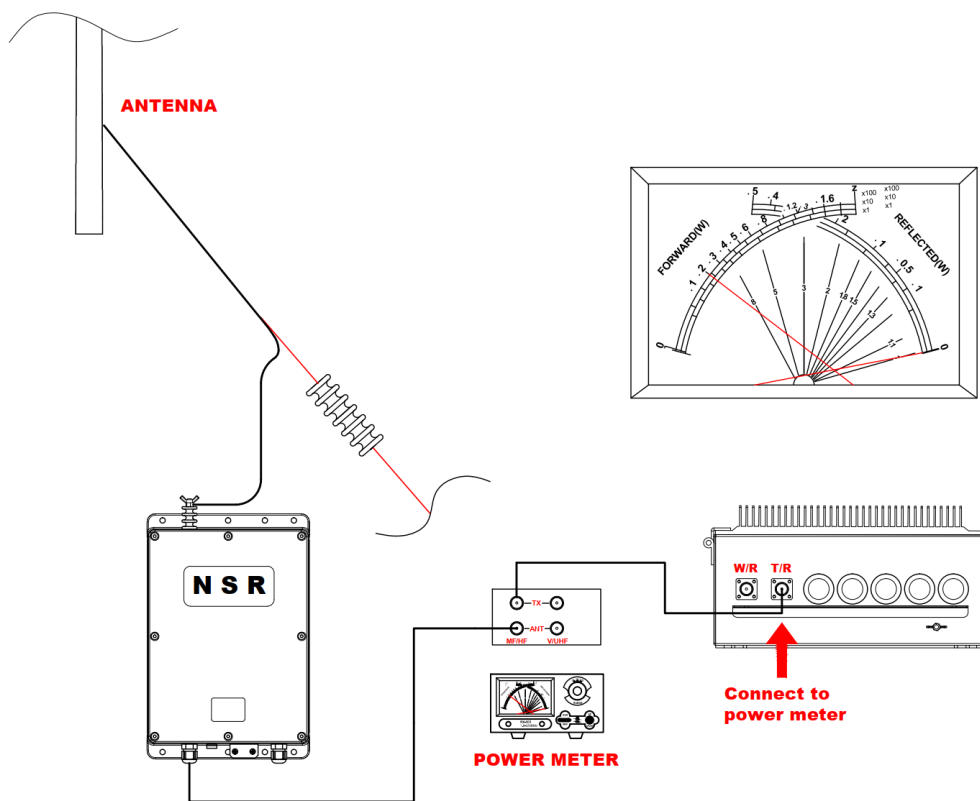
If ATU keeps TUNING always (keep making ta..ta.. sound):

- 1) Improve the ground.
- 2) Place a temporary wire antenna about 10-12 meters instead of the existing antenna, to confirm if the fault is caused by the antenna.

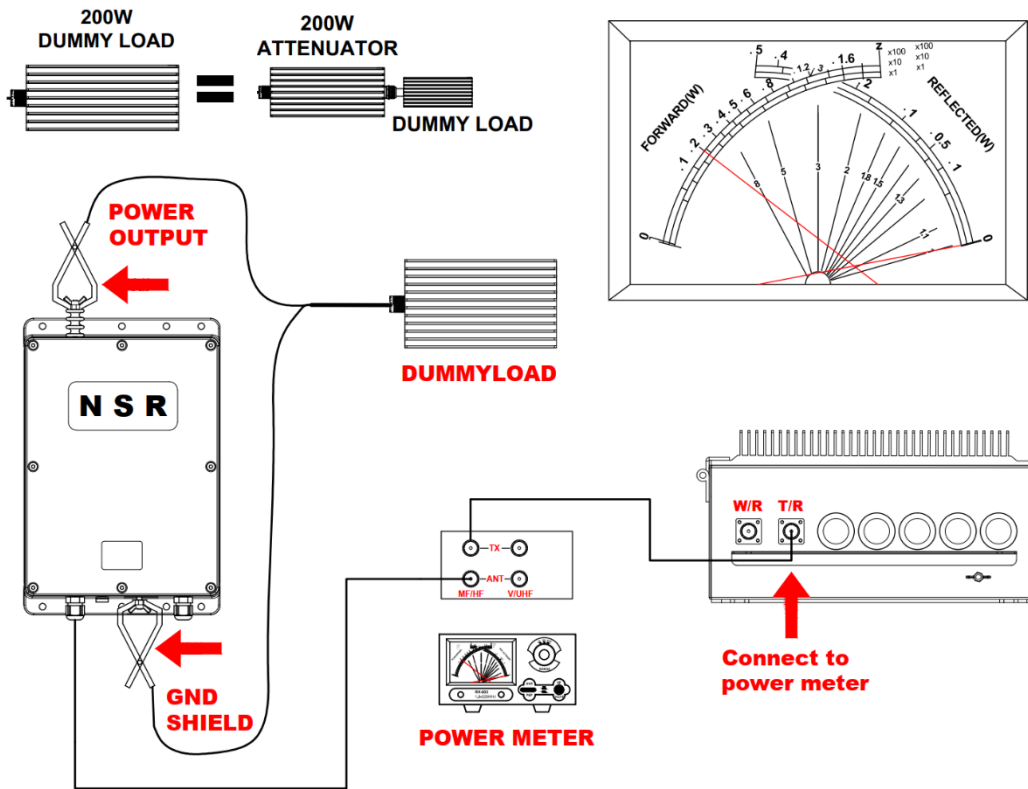
The ATU should work fine. But still TUNE ERR, that means the READY signal is not received by the transceiver unit, the problem may come from NHR201.



Test Connection 1: Power Meter + Coupler + Antenna

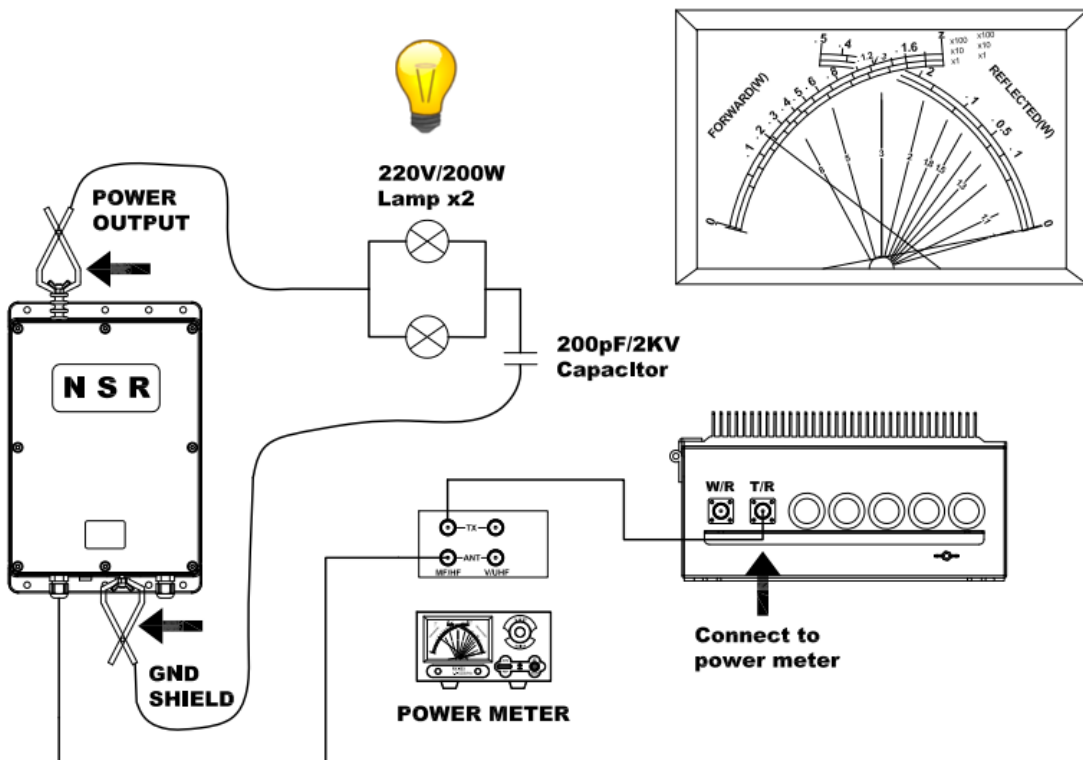


Test Connection 2: Power Meter + ATU + Dummy load



Note: The 200W dummy load can be replaced by a 200W/40dB attenuator and a 20W dummy load.

Test Connection 3: Power Meter + ATU + Lamp



3.2 Antenna failure

[ALERT VIEW]	
ID	3115 : 313
CATEGORY	B
PRIORITY	WARNING
STATE	ACTIVE-UNACKNOWLEDGED
TEXT	ANTENNA:FAILURE VSWR error
BACK	

Solution:

- 1) Upgrade the firmware of the control unit to V1.18 20230418 or later. *See Section 1.2.*
If possible, the firmware of the transceiver unit can be upgraded to V1.13 20230406 or later.
It will automatically tune before transmitting. If the tuning is OK, high VSWR will not happen easily.
- 2) Check the ATU, which should tune OK at every band. “READY” signal should be sent from the ATU to the transceiver unit.

Measure the 15V input at the coupler, it should be around 12-15V.

The ATU will make “Ta..Ta..Ta..” sound when tuning a new frequency never used before.

If not tuning OK at every band, the ATU or RF cable & antenna should have some problems, or the grounding should be improved according to Section 2.6 Grounding of ATU.

- 3) Check the RF cable, including the connector and the antenna.

Usually, the problem comes from them.

The RF cable should be RG213 or better.

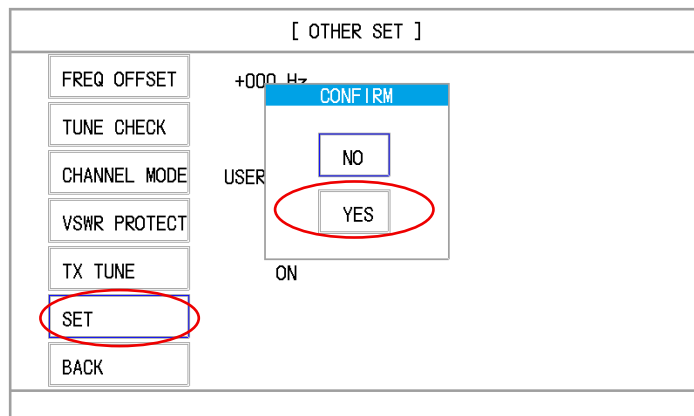
Sometimes even if the connector measured good, but unable to withstand high power and makes high VSWR.

- 4) If all steps before are OK, still VSWR alarm. Come to this step.

If tuning is OK at every band, and communication is OK with long distance station, please turn off the VSWR software protection from [SERVICE] - [ADVANCED] - [OTHER SET] - [VSWR PROTECT]. A password is required.

Set [VSWR PROTECT] to “OFF”, then confirm. After that, there will be no VSWR alarm.

[OTHER SET]	
FREQ OFFSET	+000 Hz
TUNE CHECK	HW
CHANNEL MODE	USER ITU
VSWR PROTECT	OFF
TX TUNE	ON
SET	
BACK	



3.3 No acknowledge for DSC call

- 1) For Control Unit APP: V1.22 20240712+Transceiver CTRL: V1.15 20240712 and later versions, after a DSC call is sent, the DSC response sound can be monitored on the DSC screen.
- 2) Confirm the DSC type and MMSI sent by other station, and it is generally recommended to use type TEST CALL (Section 2.1 Steps to Send Test DSC Call).
- 3) The grounding will affect the receiving. If possible, make it better.
- 4) Please press [TUNE] at every frequency band. It should be "TUNE OK" at every band.
- 5) Check the RF cable and connector. Usually, they will cause the trouble.
- 6) Check the receiving. Receive a voice from the broadcast station. BBC, time station, etc.
- 7) Conduct SSB voice calls with other stations in the DSC testing frequency band.
- 8) Neither 5 nor 6 works, try bypassing the LNA board (see 2.2.2/4) and test 5 or 6 again.
- 9) Use GMDSS tester to test the DSC reception of own station.

3.4 DSC TX OK, RX fail

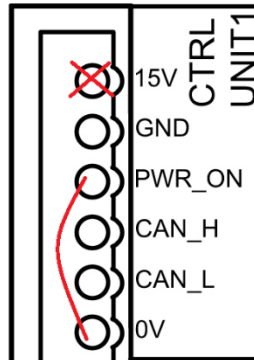
The DSC sent by own station can be received by other station, but the DSC sent by other station can not be received by own station.

- 1) Confirm the DSC type and MMSI sent by other station, and it is generally recommended to use TEST CALL.
- 2) For Control Unit APP: V1.22 20240712+Transceiver CTRL: V1.15 20240712 and later versions, after a DSC call is sent, the DSC response sound can be monitored on the DSC screen.
- 3) Conduct SSB voice calls with other station in the DSC testing frequency band.
- 4) Receive voice from the broadcast station. BBC etc.
- 5) Neither 5 nor 6 works, try bypassing the LNA board (see 2.2.2/4) and test 5 or 6 again.
- 6) Use GMDSS tester to test the DSC reception of own station.

3.5 Can't power on

Steps:

- 1) Plug out the 15V from the CTRL UNIT1 connector. Short circuit PWR_ON and 0V.



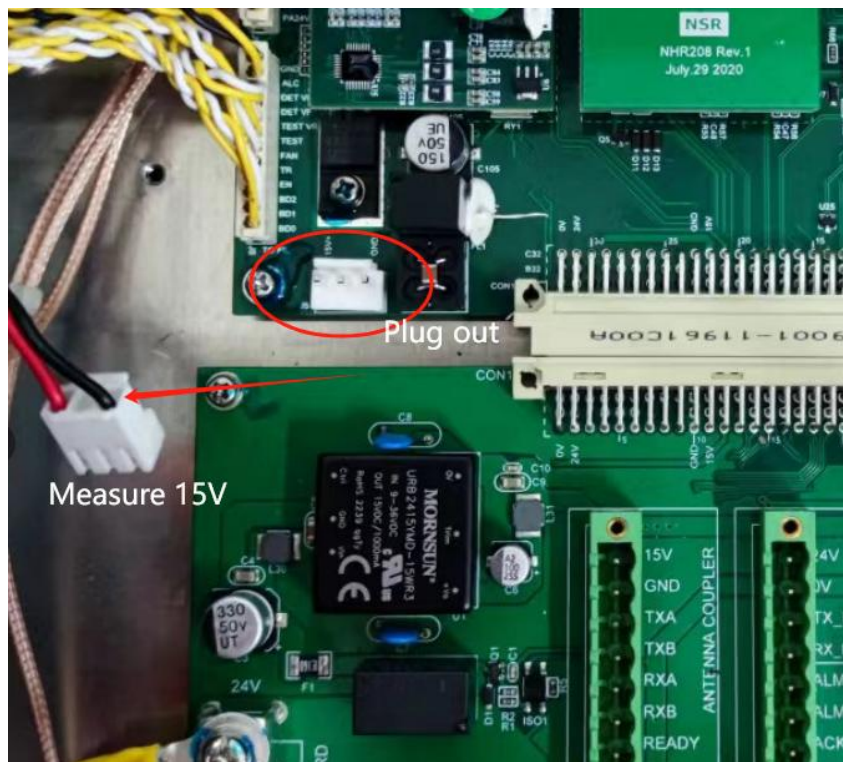
If the transceiver is powered ON normally at this step, that means the control unit is faulty. Please check as Step 4.

If the transceiver is not powered ON and no 15V between “15V” and “GND”, please check as Step 2.

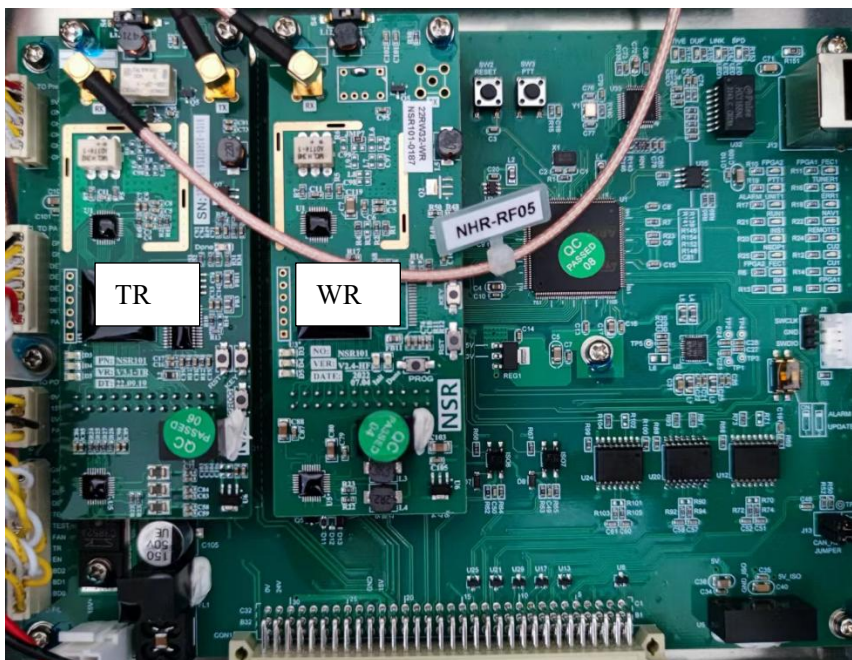
- 2) Plug out 15V connector from NHR201 PCB. Measure the voltage at the connector between the red and black wires.

If there is no 15V, the NHR202 PCB should be faulty.

If the 15V is OK, something is short-circuited at NHR201 mainboard. Please check as Step 3.

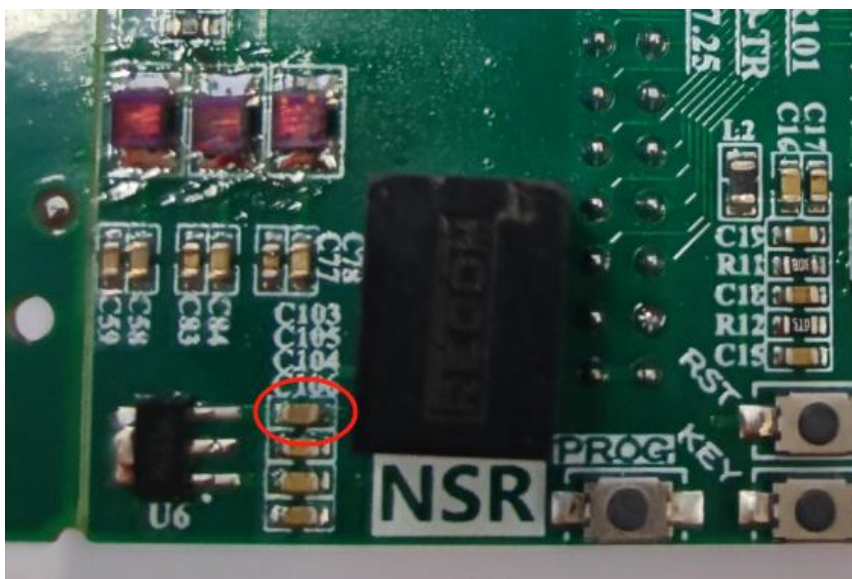


- 3) Remove the TR and WR PCB, and check the 15V at Step 1 when PWR_ON and 0V are shorted.



If 15V is OK when the TR and WR PCB are removed, the TR or WR PCB may have something short-circuited.

Check C103 (10uf 25V 0603) at NSR101 PCB. If C103 short-circuit, it can be removed.



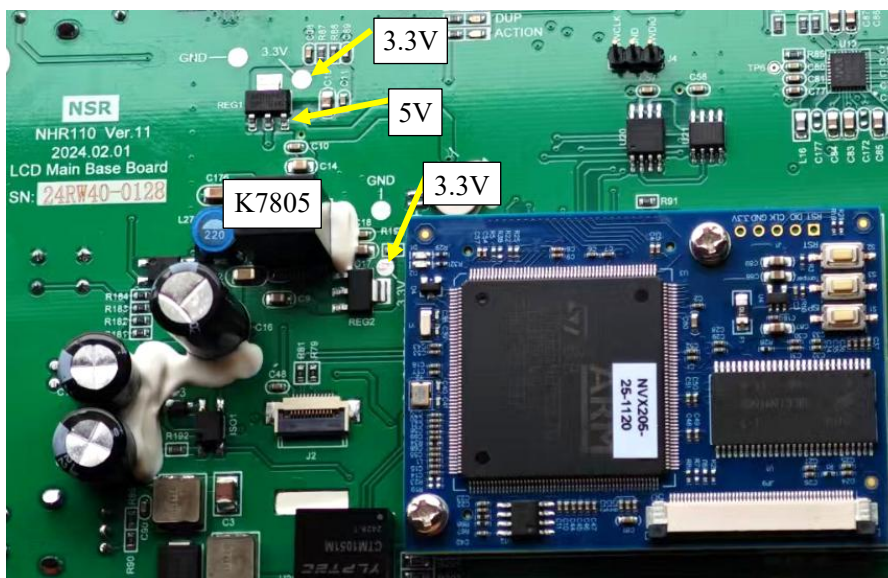
4) Recover the connection between the control unit and transceiver.

If keep pressing the volume key, the screen is ON, and the screen is OFF after releasing the volume key, the ON_OFF control circuit may be faulty. Change the component marked to 0 ohm resistor or SZMMSZ4679T1G zener diode.



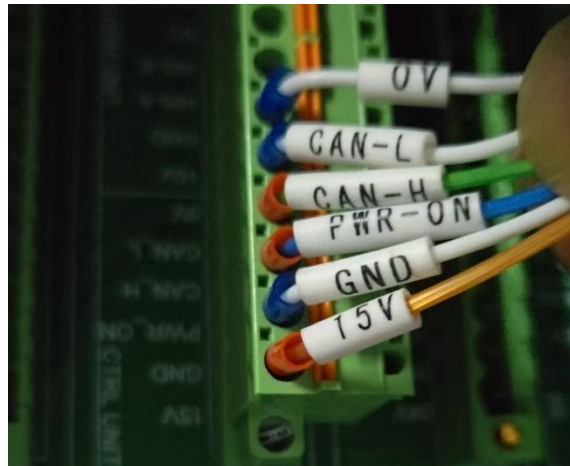
If keep pressing the volume key, the screen is always OFF. Please check the voltage of NHR110 PCB when the volume key is kept pressing.

If 5V is not OK, please replace the DC-DC converter K7805.



3.6 “CONNECTING” shown always

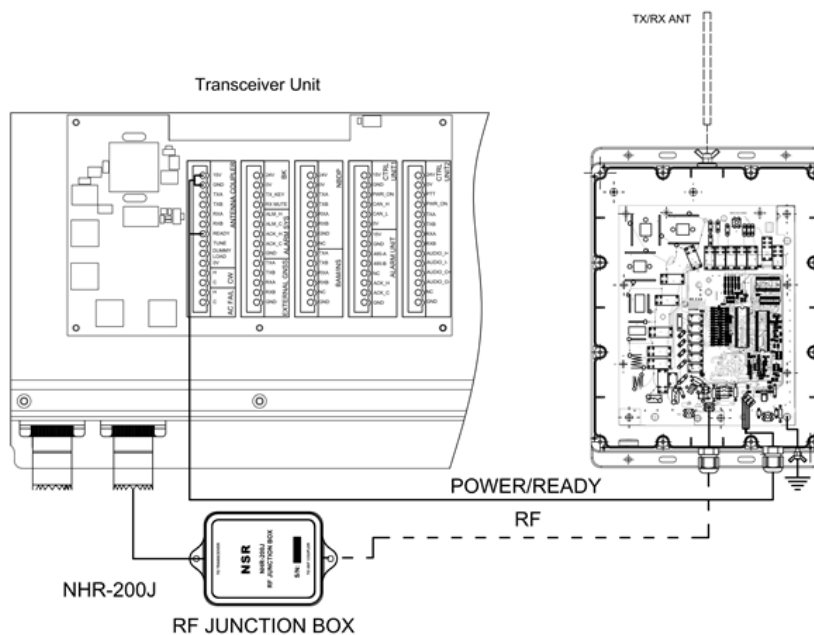
- 1) If the control unit or transceiver unit has been upgraded or replaced by a new one, the software version should be matched (See Section 1.2 Software Compatibility), or use the latest version for both the control unit and transceiver.
- 2) Check the cable connection between the control unit and transceiver. The cable should be originally supplied from NSR. If the required length exceeds the standard configuration, please contact NSR.



- 3) Replace the control unit, the software version should be matched (See Section 1.2 Software Compatibility).
- 4) Replace the NHR201 and NHR204 PCB at transceiver. The software version should be matched (See Section 1.2 Software Compatibility).

3.7 “CONNECTING” shown when transmitting

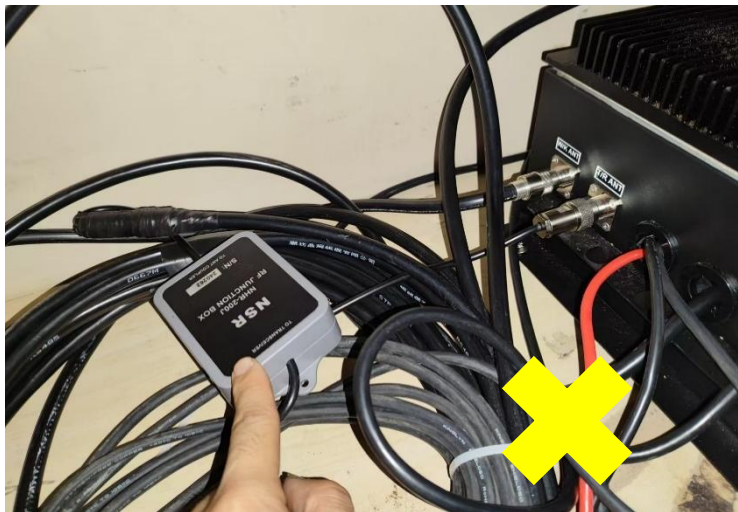
Install NHR-200J RF junction box between the transceiver unit and ATU. It is used to suppress current variations for improving antenna matching.



If there are any extra cables, please do not roll them up. They need to be cut or straightened.



And please do not bundle data cables and RF cables together.



Do the testing according to Section 3.2 Antenna Failure.

If all the above is OK, improve the grounding.

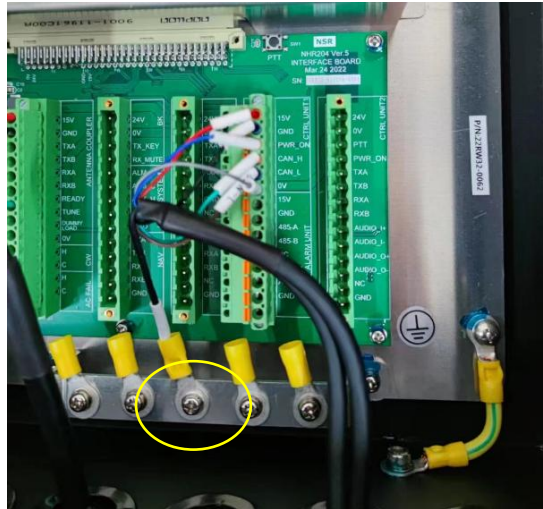
1) ATU



The grounding copper strip needs to be welded to the hull to ensure good grounding.

2) Transceiver unit





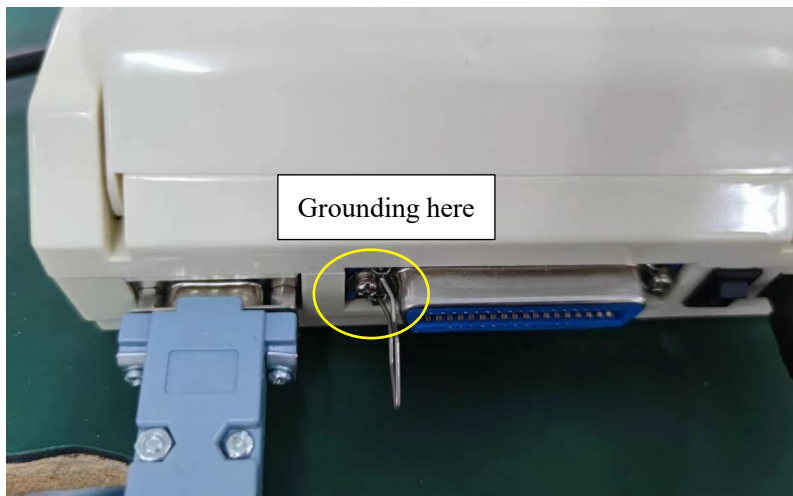
Confirm the shield of the cable to the control unit is well grounded.

3) Control unit



Confirm the control unit is well grounded.

4) Printer



Confirm the printer (if any) is well grounded.

5) NBDP terminal



Confirm the NBDP terminal (if any) is well grounded.

3.8 Cannot communicate over long distance

Can communicate with the nearby station, but cannot communicate with the station far away.

- 1) 12, 16MHz bands are recommended for more than 500nm distance.
- 2) 8, 12 MHz bands are recommended for more than 200nm distance.
- 3) 2, 4, 6, 8MHz bands are recommended for less than 200nm distance.

The communication effect is often affected by the weather and time.

- 1) Check the transmission power according to Section 2.7.
- 2) Check the receiving. Receive a voice from the broadcast station. BBC, time station, etc...
- 3) If possible, test as Section 2.3 Test TR Receiving with GMDSS tester.

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