



Simrad ME70
Multibeam scientific echo sounder
Factory Acceptance Test

This is the Factory Acceptance Test for the Simrad ME70 Multibeam scientific echo sounder.

The purpose of this Factory Acceptance Test is to verify that the ME70 system is fully functional, and meets the operational requirements. It is then ready for packing and shipment. When all the tasks have been done, the report form must be signed by the relevant parties. The completed document then becomes the official report.

Vessel/Customer

Serial numbers (if applicable)	
Processor Unit	
Transceiver Unit	
Power Supply Unit 1	
Power Supply Unit 2	
Power Supply Unit 3	
Transducer	

Document information

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Warning

The equipment to which this manual applies must only be used for the purpose for which it was designed. Improper use or maintenance may cause damage to the equipment and/or injury to personnel. You must be familiar with the contents of the appropriate manuals before attempting to operate or work on the equipment.

Kongsberg Maritime disclaims any responsibility for damage or injury caused by improper installation, use or maintenance of the equipment.

Disclaimer

Kongsberg Maritime AS endeavours to ensure that all information in this document is correct and fairly stated, but does not accept liability for any errors or omissions.

Support information

If you require maintenance or repair, contact your local dealer. You can also contact us using the following address: simrad.support@simrad.com. If you need information about our other products, visit <https://www.simrad.com>. On this website you will also find a list of our dealers and distributors.

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Introduction

Topics

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Purpose

This is the Factory Acceptance Test for the Simrad ME70 Multibeam scientific echo sounder.

The purpose of this Factory Acceptance Test is to verify that the ME70 system is fully functional, and meets the operational requirements. It is then ready for packing and shipment. When all the tasks have been done, the report form must be signed by the relevant parties. The completed document then becomes the official report.

Note

In some cases the transducer is shipped to the installation shipyard before the Factory Acceptance Test takes place. The hardware registration is then omitted. The Factory Acceptance Test is done with a replacement transducer or a dummyload.

Personnel and location

Successful completion of the test requires qualified and experienced test engineers and/or technicians.

This Factory Acceptance Test is done at the Kongsberg Maritime premises in Horten, Norway. The test is done by personnel from Kongsberg Maritime. All personnel must have good knowledge of the product and/or module(s) at hand. Basic knowledge of computer BIOS and the Windows® operating systems, as well as electronic circuitry and device programming is required.

Representatives from the client and/or end user may be present to witness the test and results.

As with all assembly and test procedures related to advanced technical and/or electronic equipment, the skill of the operator is vital to a successful completion of the tasks. The only way to secure high quality of our products is first rate workmanship and high professional standards throughout the production chain.

It is equally important that all members of the production and test crews show initiative, and are willing to suggest improvements to functionality, design, procedures and documents. If you find a mistake in a document, or find that information is missing, offer this information to the proper authorities without further delay. Likewise, your experience as a skilled worker is valuable. Please forward any suggestions to make improvements to the product, the design, the production method, or any other matters related to your expertise.

Referenced documents

The installation and use of the ME70 is described in several documents and end user manuals.

This list is not complete. Additional documents and end user manuals may be available for the ME70. These publications are not relevant for this Factory Acceptance Test.

Note

Unless specified in the applicable procedure(s), the ME70 publications listed here are not required during this Factory Acceptance Test.

All the document numbers refer to the English version of each publication.

End user manuals

- **Reference Manual and On-line Help:** 328588

Software documents

- **Software Release Note:** 308386

Customer acceptance test procedures

- **Factory Acceptance Test:** 307958
- **Harbour Acceptance Test:** 307959
- **Sea Acceptance Test:** 307960

Tools and test equipment

Specific tools and test equipment are required for this Simrad ME70 Factory Acceptance Test. The required tools and equipment must be made available before the test can start.

The required test equipment is listed. For each item, record the instrument's serial number and - if relevant - its calibration expiry date.

Multimeter (Make and model)	Serial number	Calibration expiry date

Personal computer (Make and model)	Serial number	Calibration expiry date
	N/A	N/A

Dummyload (Make and model)	Serial number	Calibration expiry date
Kongsberg Maritime 321913	N/A	N/A
You need one dummyload for each Transceiver Unit connector.		

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NMEA Simulator software	Serial number	Calibration expiry date
	N/A	N/A

Acceptance test summary

The purpose of this Factory Acceptance Test is to verify that the ME70 system is fully functional, and meets the operational requirements. This acceptance test summary is provided to offer an overview of the functions and items that need to be tested. References are made to the individual chapters in this Factory Acceptance Test.

Procedure

- 1 Record the software and hardware items that are included in the test.
 - [Hardware and software registration, page 10](#)
- 2 Do a visual inspection of each unit that is comprised by the ME70 delivery.
 - [Visual inspection, page 17](#)
- 3 Test the main functionality of the ME70.
 - [Testing the ME70 operational functionality, page 24](#)
- 4 When all the tests have been successfully concluded, open the *Customer acceptance form*, and fill it in with the relevant signatures.
 - [Customer acceptance form, page 38](#)

The end user and technical documentation for the ME70 contains several procedures that are also applicable for this Factory Acceptance Test. These procedures are not part of the Factory Acceptance Test. They are provided for reference purposes only.

- [Secondary procedures, page 39](#)

Hardware and software registration

Topics

[Software items, page 11](#)

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Software items

Every software program that is provided as a part of the ME70 delivery must be registered. Part number and software version must be registered. When software media (USB flash drive, CD, DVD etc) is provided, the part number of the media and the ME70 software version provided on the media must be registered.

Software	Part number	Software version
Simrad ME70	308305	

Software media	Part number	Software version
Simrad ME70	387585	
The software version on the software media shall be the same as the version installed on the Processor Unit. End user documentation is included on the same software media.		

Hardware items

Topics

[Display, page 12](#)

[Processor Unit, page 12](#)

[Transceiver Unit, page 13](#)

[Power Supply Unit, page 16](#)

[Transducer, page 16](#)

Display

Each display provided with the ME70 delivery must be uniquely identified. Make(s), model(s), part number(s) and serial number(s) must be registered. Any unit that is not provided by Kongsberg Maritime AS does not need to be registered. If applicable, add the order number.

Display (Make and model) ¹	Part number ²	Serial number	Revision
¹ The unit contains neither circuit boards nor modules that need to be identified separately.			
² This is the part number on the unit label.			

Processor Unit

The Processor Unit provided with the ME70 delivery must be uniquely identified. Make, model, part number and serial number must be registered.

Processor Unit ¹	Part number ²	Serial number	Revision
ME70 Processor Unit (with ME70 software)	382922		
¹ The unit contains neither circuit boards nor modules that need to be identified separately.			
² This is the part number on the unit label.			

Transceiver Unit

The Transceiver Unit provided with the ME70 delivery must be uniquely identified. Make, model, part number and serial number must be registered. The Transceiver Unit contains circuit boards and modules that must be recorded separately.

ME70 Transceiver Unit

The Transceiver Unit controls the transmission and reception made by the 800 transmitters and 800 receiver channels. 25 identical transceiver boards are used.

Transceiver Unit ¹	Part number ²	Serial number	Revision
ME70 Transceiver Unit	345559		
¹ This unit contains circuit boards or modules that must identified separately. Observe the relevant hardware registration tables.			
² This is the part number on the unit label.			

LPT32 Transceiver board

Transceiver boards (From right)	Revision	Serial number
TRXU2		
0		
1		
2		
3		

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Transceiver boards (From right)	Revision	Serial number
4		
5		
6		
7		
8		
TRXU1		
9		
10		
11		
12		
13		
14		
15		
16		
TRXU0		
17		

Transceiver boards (From right)	Revision	Serial number
18		
19		
20		
21		
22		
23		
24		
Transceiver board (Type): LPT32 Transceiver board		
Part number: 425841		

Ethernet switch

Make and model (Make and model) ¹	Part number ²	Serial number	Revision
Hewlett Packard HP2920-48G	396638		
¹ The unit contains neither circuit boards nor modules that need to be identified separately. If the Hewlett Packard HP2920-48G Ethernet switch is not used with this delivery, fill in information about the replacement type in the empty row.			
² This is the part number on the unit label.			

Power Supply Unit

Each Power Supply Unit provided with the ME70 delivery must be uniquely identified. Make, model, part number and serial number must be recorded.

Power Supply Unit ¹	Part number ²	Serial number
ME70 Power Supply Unit 1	304834	
ME70 Power Supply Unit 2	304834	
ME70 Power Supply Unit 3	304834	
¹ These units do not contain any circuit boards or modules that must be identified separately.		
² This is the part number on the unit label.		

Transducer

The transducer provided with the ME70 delivery must be uniquely identified.

Transducer ¹	Part number ²	Serial number
ME70 Transducer	312-208110	
¹ The unit contains neither circuit boards nor modules that need to be identified separately.		
² This is the part number on the unit label.		

Note

In some cases the transducer is shipped to the installation shipyard before the Factory Acceptance Test takes place. The hardware registration is then omitted.

Visual inspection

Topics

[Inspecting logistic items, page 18](#)

[Visual inspection of the display, page 18](#)

[Visual inspection of the Processor Unit, page 19](#)

[Visual inspection of the Transceiver Unit, page 20](#)

[Visual inspection of the Power Supply Unit, page 21](#)

[Inspecting the transducer, page 22](#)

Inspecting logistic items

All relevant logistic items that are included with the ME70 delivery shall be inspected. This includes end-user manuals, software and software media. If spare parts are included in the delivery, these shall also be inspected.

Prerequisites

The list of logistic items to be delivered (order confirmation or contract) must be available. All the relevant items must be available for inspection. Neither tools nor instruments are required.

Context

The verification of the operating system license is only applicable if the Processor Unit is provided by Simrad as a part of the ME70 delivery.

Procedure

- 1 Verify that the ME70 end-user manuals have been provided.
- 2 Verify that the applicable ME70 software media (USB flash disk, CD, DVD etc) have been provided.
- 3 Verify that the operating system software license stickers is placed on the Processor Unit.
- 4 Verify that the spare parts provided matches the order confirmation for the ME70 delivery.

Result

Requirements	Results
All logistical items are available.	
Date and signature:	

Visual inspection of the display

A visual inspection of the ME70 display is required to verify its physical condition and appearance prior to delivery.

Prerequisites

The ME70 has been set up with its hardware units connected as specified in the ME70 *Installation manual*. The ME70 is turned off. Neither tools nor instruments are required.

Context

This test procedure is only applicable when the display is provided by Kongsberg Maritime as a part of the ME70 delivery.

Procedure

- 1 Make sure that the unit's serial number has been recorded in the list of hardware items.
- 2 Make sure that the display is new.
- 3 Make sure that the unit is not physically damaged, and that the paint-work is clean without dents or scratches.
- 4 Make sure that the unit has been identified with the relevant product label(s), and that one label includes the part and serial numbers.

Result

Requirements	Results
The display is new, clean and free from scratches, dents or other physical damage.	
The display is clearly identified with the relevant product labels.	
Date and signature:	

Visual inspection of the Processor Unit

A visual inspection of the ME70 Processor Unit is required to verify its physical condition and appearance prior to delivery.

Prerequisites

The ME70 has been set up with its hardware units connected as specified in the ME70 *Installation manual*. The ME70 is turned off. Neither tools nor instruments are required.

Procedure

- 1 Make sure that the unit's serial number has been recorded in the list of hardware items.
- 2 Make sure that the computer is new.
- 3 Make sure that the unit is not physically damaged, and that the paint-work is clean without dents or scratches.
- 4 Make sure that the unit has been identified with the relevant product label(s), and that one label includes the part and serial numbers.

Result

Requirements	Results
The Processor Unit is new, clean and free from scratches, dents or other physical damage.	
The Processor Unit is clearly identified with the relevant product labels.	
Date and signature:	

Visual inspection of the Transceiver Unit

A visual inspection of the Transceiver Unit is required to verify its physical condition and appearance prior to delivery.

Prerequisites

The ME70 has been set up with its hardware units connected as specified in the ME70 *Installation manual*. The ME70 is turned off. Neither tools nor instruments are required.

Procedure

- 1 Make sure that the Transceiver Unit is new.
- 2 Make sure that the Transceiver Unit is fully populated with all circuit boards and modules mounted.
- 3 Make sure that the unit is not physically damaged, and that the paint-work is clean without dents or scratches.
- 4 Make sure that the unit has been identified with the relevant product label(s), and that one label includes the part and serial numbers.
- 5 Make sure that the unit's serial number has been recorded in the list of hardware items.

Result

Requirements	Results
The Transceiver Unit is new, clean and free from scratches, dents or other physical damage.	
The Transceiver Unit is clearly identified with the relevant product labels.	
The Transceiver Unit is fully populated with all circuit boards and modules mounted.	
Date and signature:	

Visual inspection of the Power Supply Unit

A visual inspection of the Power Supply Unit is required to verify its physical condition and appearance prior to delivery. Since more than one Power Supply Unit is used, each must be inspected separately.

Prerequisites

The ME70 has been set up with its hardware units connected as specified in the ME70 *Installation manual*. The ME70 is turned off. Neither tools nor instruments are required.

Procedure

- 1 Verify that the Power Supply Unit is new.
- 2 Make sure that the unit is not physically damaged, and that the paint-work is clean without dents or scratches.
- 3 Make sure that the unit has been identified with the relevant product label(s), and that one label includes the part and serial numbers.
- 4 Make sure that the unit's serial number has been recorded in the list of hardware items.
- 5 Repeat for each Power Supply Unit.

Result

Requirements / 1	Results
The Power Supply Unit is new, clean and free from scratches, dents or other physical damage.	
The Power Supply Unit is clearly identified with the relevant product labels.	
Date and signature:	

Requirements / 2	Results
The Power Supply Unit is new, clean and free from scratches, dents or other physical damage.	
The Power Supply Unit is clearly identified with the relevant product labels.	
Date and signature:	

Requirements / 3	Results
The Power Supply Unit is new, clean and free from scratches, dents or other physical damage.	
The Power Supply Unit is clearly identified with the relevant product labels.	
Date and signature:	

Inspecting the transducer

A visual inspection of the transducer is required to verify its physical condition and appearance prior to delivery. The transducer surface must be inspected for potential damage that may have an effect on ME70 operation.

Prerequisites

The ME70 has been set up with its hardware units connected as specified in the ME70 *Installation manual*.

- The ME70 is turned off.
- Neither tools nor instruments are required.
- If you find damage, you need a high resolution camera to document it.

Context

The transducer face is covered with a red protective coating made of a special plastic type. The red protective coating is an vital part of the transducer. It is very important that neither this coating nor the internal parts of the transducer are damaged during the handling, installation or cleaning. Any holes and/or scratches in the transducer surface will allow water to penetrate the transducer. If a leak occurs, the transducer must be replaced.

Note

In some cases the transducer is shipped to the installation shipyard before the Factory Acceptance Test takes place. This inspection is then omitted.

Procedure

- 1 Make sure that the transducer is new.
- 2 Make sure that the transducer is not physically damaged, and that the surface is clean without dents or scratches.
- 3 If you find suspicious damage, take high resolution photos that show the damage.
- 4 Make sure that the transducer cables are not damaged.
- 5 Make sure that the transducer is uniquely identified with part and serial numbers.
- 6 Make sure that the serial number on the transducer has been recorded in the list of hardware items.

Result

Requirements	Results
The transducer is new, clean and free from scratches, dents or other physical damage.	
Date and signature:	

Testing the ME70 operational functionality

Topics

[Assembling the ME70 Multibeam scientific echo sounder to turn it on, page 24](#)

[Testing the serial interfaces on the Processor Unit, page 26](#)

[Testing the receiver channels with the BITE Matrix functionality, page 27](#)

[Testing the transmitter channels with the BITE Matrix functionality, page 29](#)

[Measuring the power supply output voltages in the Transceiver Unit, page 31](#)

[Recording raw data, page 35](#)

Assembling the ME70 Multibeam scientific echo sounder to turn it on

Prior to testing the ME70, the complete system must be assembled and turned on.

Prerequisites

You need the following equipment:

- All ME70 system units
- Dummyloads
- ME70 Installation Manual
- ME70 Reference Manual

Observe the cabling and assembly instructions in the ME70 *Installation manual*. See the power-up procedure in the ME70 *Reference Manual*. A selection of basic operating

procedures for the ME70 are provided in the *Secondary procedures* chapter in this Factory Acceptance Test.

Procedure

- 1 Connect the ME70 units according to the instructions and drawings provided in the *ME70 Installation manual*.
- 2 Connect the dummyloads to the Transceiver Unit outputs.
- 3 Verify that the ME70 units are correctly connected together.
- 4 Turn on the ME70 from the Processor Unit.
For a detailed procedure, see the *ME70 Reference Manual*.
- 5 Verify that the Processor Unit and the Transceiver Unit start.
- 6 Verify that the ME70 presentation appears after a few minutes.
- 7 On the **Main** menu, set **Beam Mode** to *Example 1 Sector Uniform Weighting*
- 8 Open the **Operation** menu.
 - a Set **Operation** to *Normal*.
 - b Set **Range** to: *100 m*.
 - c Set **Ping** to *On*.
 - d Set **Ping Mode** to *Interval*.
 - e Set **Ping Interval** to *1 s*.
 - f Set **Tx Mode** to *Active*
 - g Set **Tx Power** to *Maximum*.
- 9 Observe the LED indicators on each dummyload, and make sure that the ME70 Transceiver Unit transmits on all channels.

Result

Requirements	Results
The ME70 is assembled according to the instructions in the <i>ME70 Installation manual</i> , but with dummyloads.	
The ME70 starts when it is turned on from the Processor Unit.	
The ME70 presentation appears after a few minutes.	
The ME70 transmits to each dummyload.	
Date and signature:	

Testing the serial interfaces on the Processor Unit

The ME70 Processor Unit offers a number of serial lines to communicate with external devices. These interface capabilities must be tested.

Prerequisites

The ME70 has been set up with its hardware units connected as specified in the ME70 *Installation manual*.

- The ME70 system is turned on and operates normally.
- If applicable: The transducer is replaced with a dummyload.
- A personal computer with a sensor simulator program is connected to the Processor Unit. The simulator is active.

You need the following test equipment:

- Personal computer
- NMEA Simulator software

Context

Refer to the relevant ME70 end user manuals for information about the serial communication setup.

Procedure

- 1 Connect a serial line cable from the personal computer to the first serial port on the Processor Unit.
- 2 Start the ME70 program.
- 3 Start the Sensor Simulator program.
- 4 Set up the relevant communication parameters for the first port to accept the sensor data.

The communication parameters defined for NMEA 0183 are:

- **Baud rate:** 4800 bit/s
- **Data bits:** 8
- **Parity:** Even
- **Stop bits:** 1

Some instruments may provide other parameters and/or options. You must always check the relevant technical documentation supplied by the manufacturer.

- 5 In the ME70 user interface, open the **Port Monitor** dialog box.
The **Port Monitor** dialog box allows you to study the communication stream on the chosen serial line port.
- 6 Make sure that the sensor data are received.
- 7 Make sure that the information from the sensor is displayed on the top bar in the ME70 user interface.
- 8 Repeat the test for all the serial ports using different datagrams for heading, position, speed and distance.
- 9 Stop the test.
 - a Close the Sensor Simulator program.
 - b Disconnect the serial line cable from the computer.
 - c Turn off the computer.

Result

Requirements	Results
The Processor Unit accepts the serial line information on all relevant COM ports.	
The sensor data is shown in the ME70 presentation.	
Date and signature:	

Testing the receiver channels with the BITE Matrix functionality

The **Matrix** page allows you to monitor the average signal values or signal phases from each of the channels and transducer elements in the ME70. The presentation is provided on a matrix corresponding to the element locations in the transducer. For receiver testing, the ME70 must be operational, and both operational and BITE parameters must be known.

Prerequisites

The ME70 has been set up with its hardware units connected as specified in the ME70 *Installation manual*.

- If applicable: The transducer is replaced with a dummyload.
- The ME70 system is turned on and operates normally.

Context

When you move the cursor over the matrix presentation of the ME70 transceiver channels, each element in the transducer can be clearly identified as a rectangle. If you place the cursor on top of one of these rectangles, a small yellow tool-tip will identify key information.

Procedure

- 1 On the **Main** menu, set **Beam Mode** to *Test - SAT Config*.
- 2 Open the **Operation** menu.
 - a Set **Operation** to *Normal*.
 - b Set **Range** to: *100 m*.
 - c Set **Ping** to *On*.
 - d Set **Ping Mode** to *Interval*.
 - e Set **Ping Interval** to *1 s*.
 - f Set **Tx Mode** to *Passive*
 - g Set **Tx Power** to *Maximum*.

- 3 Open the **BITE Matrix** page.
 - a Open the **Setup** menu.
 - b Select **BITE** to open the dialog box.



Observe that the **BITE** (Built In Test Equipment) dialog box opens.

- c Open the **BITE Matrix** page.
- 4 Choose these settings:
 - a Select **Element amplitude**.
 - b Set **Start Averaging** to *1000*.
 - c Set **Averaging Range** to *400*.
 - d Set **Scale** to *Automatic*.
 - e Set **Element size in pixel** to *Height 24 pixels* and *Width 12 pixels*.
 - f Set **Transmit pulse** to *Current*.
- 5 Observe the average of the samples starting from sample *1000*.
These samples are all inside the receive period of the ping.

- 6 Locate any elements that exceeds the requirement for difference between neighbouring elements.

Record the noisy elements in the result table. The difference between neighbouring elements may be large due to noise in the test basin. Noisy elements on the side of the transducer must therefore be ignored.

- 7 Evaluate the level for the functional elements by pointing at each element and read the level from the tool tip. Check for neighbouring elements with the maximum deviation.
- 8 Make a screen capture of the **Matrix** page.

Save the screen capture using a unique file name that identifies context, date, time and vessel. Attach the image file to the electronic copy of the test report. Print the image in colour if the report is submitted on paper.

Result

Requirements	Results
The information presented by the Matrix page verifies that the ME70 is fully operational.	
The difference between neighbouring elements is less than 25 dB.	
Noisy elements:	
A screen capture of the Matrix page is archived.	
Date and signature:	

Testing the transmitter channels with the BITE Matrix functionality

The **Matrix** page allows you to monitor the average signal values or signal phases from each of the channels and transducer elements in the ME70. The **Matrix** page offers a good tool for testing the transmitter and receiver circuitry. The presentation is provided on a matrix corresponding to the element locations in the transducer. For transmitter testing, the ME70 must be operational, and both operational and BITE parameters must be known.

Prerequisites

The ME70 has been set up with its hardware units connected as specified in the ME70 *Installation manual*.

- If applicable: The transducer is replaced with a dummyload.
- The ME70 system is turned on and operates normally.

Context

When you move the cursor over the matrix presentation of the ME70 transceiver channels, each element in the transducer can be clearly identified as a rectangle. If you place the cursor on top of one of these rectangles, a small yellow tool-tip will identify key information.

Procedure

- 1 On the **Main** menu, set **Beam Mode** to *Test - SAT Config*.
- 2 Open the **Operation** menu.
 - a Set **Operation** to *Normal*.
 - b Set **Range** to: *100 m*.
 - c Set **Ping** to *On*.
 - d Set **Ping Mode** to *Interval*.
 - e Set **Ping Interval** to *1 s*.
 - f Set **Tx Mode** to *Active*
 - g Set **Tx Power** to *Maximum*.

- 3 Open the **BITE Matrix** page.
 - a Open the **Setup** menu.
 - b Select **BITE** to open the dialog box.



Observe that the **BITE** (Built In Test Equipment) dialog box opens.

- c Open the **BITE Matrix** page.
- 4 Choose these settings:
 - a Select **Element amplitude**.
 - b Set **Start Averaging** to *20*.
 - c Set **Averaging Range** to *100*.
 - d Set **Scale** to *Automatic*.
 - e Set **Element size in pixel** to *Height 24 pixels* and *Width 12 pixels*.
 - f Set **Transmit pulse** to *Current*.
- 5 Observe the average of the samples starting from sample *20*.
- 6 Read the bottom text line under the Matrix presentation, and verify the deviation between neighbouring elements in the transmit pulse.
- 7 Make a screen capture of the **Matrix** page.

Save the screen capture using a unique file name that identifies context, date, time and vessel. Attach the image file to the electronic copy of the test report. Print the image in colour if the report is submitted on paper.

- 8 In the event of unserviceable elements:
 - a Set **Scale** to *Manual*.
 - b Set **Minimum** value to 35.
 - c Set **Maximum** value to 45.
 - d Evaluate the level for the functional elements with the maximum deviation. Record the weak elements in the result table.
 - e Make a screen capture of the **Matrix** page.

Save the screen capture using a unique file name that identifies context, date, time and vessel. Attach the image file to the electronic copy of the test report. Print the image in colour if the report is submitted on paper.

Result

Requirements	Results
The information presented by the Matrix page verifies that the ME70 is fully operational.	
The difference between neighbouring elements is less than 6 dB.	
Weak elements:	
A screen capture of the Matrix page is archived.	
Date and signature:	

Measuring the power supply output voltages in the Transceiver Unit

The best way to check the operation of the individual power supply modules is to measure the output voltages. However, it is better to check them on the TRXU terminal block on the rear side of the Transceiver Unit. These measurements will also reveal any voltage loss in the power cables.

Prerequisites

The ME70 has been set up with its hardware units connected as specified in the ME70 *Installation manual*.

- If applicable: The transducer is replaced with a dummyload.

- The ME70 system is turned on and operates normally.

The following specific instrument is required for this task:

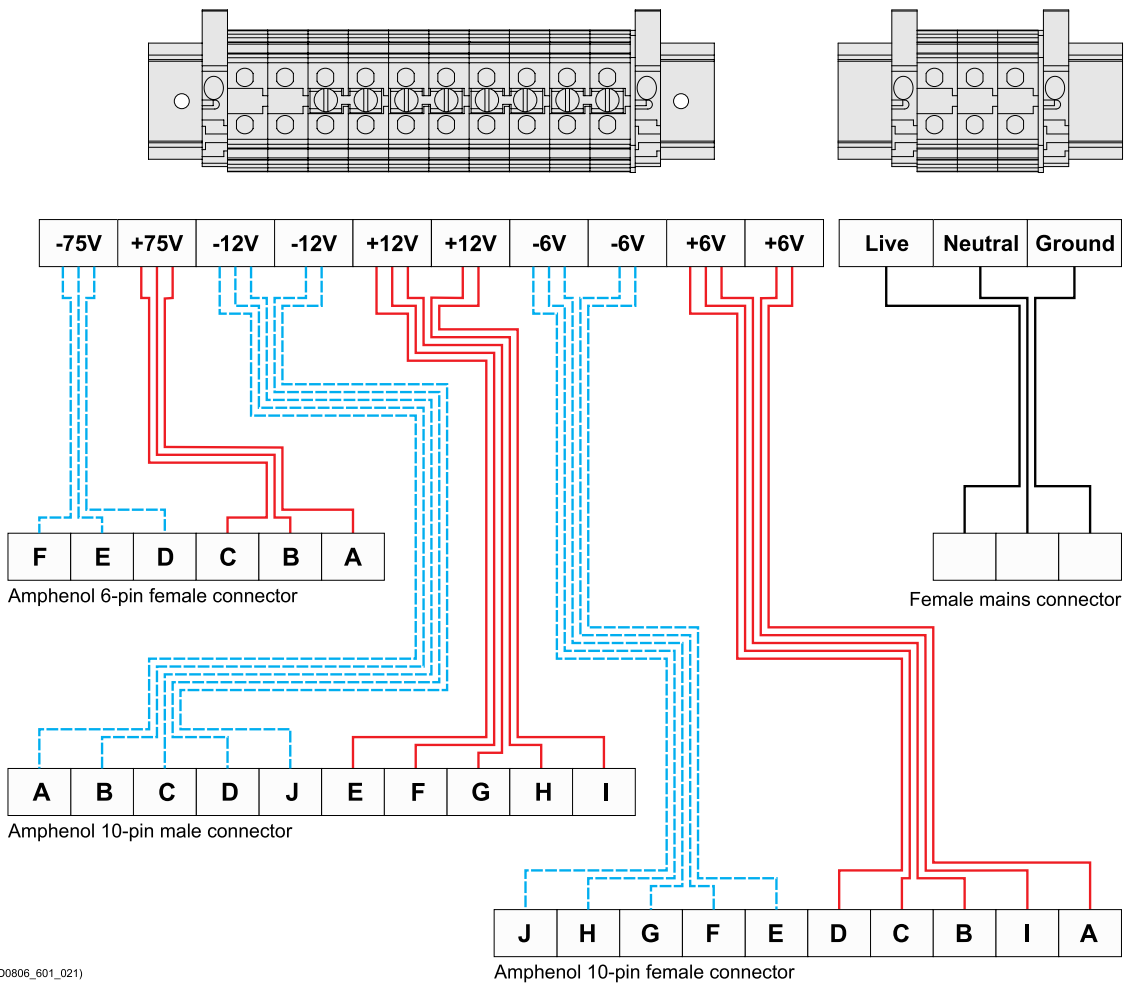
- Multimeter

Context

The outputs from the three power supply modules are connected to the terminal block on the left cabinet wall. The output from the +75 VDC power supply is fed through an NTC resistor. In order to filter out voltage variations caused by noise or load variations, large capacitors are connected to each of the +12 VDC and +6 VDC supplies. These capacitors are physically located in the three TRXU subracks in the Transceiver Unit.

The DC cables from each of the three Power Supply Units to the Transceiver Unit are all separate conductors in a bundle. 230 Vac is also included in order to power the fans in each TRXU subrack.

Inside the Transceiver Unit, the power cables are terminated in three TRXU Terminal blocks, one for each subrack. From these terminal blocks, the three DC cable bundles are fed up to the rear side of the subrack, and terminated with plugs on the Power Connector Panel.



(CD0806_601_021)

Each TRXU Terminal block is used to make the connections between the Power Supply Unit and the relevant subrack in the Transceiver Unit. The cables from each Power Supply Unit are connected to the top of the terminal block. Connections are then made to the Amphenol plugs that match the Power Connector Panel.

The AC power provided by the Power Supply Units is also terminated on the Power Connector Panel.

The following cables are included in the bundle:

- 230 VAC to TRXU subrack fans
- +6 VDC (two red cables)
- -6 VDC (two blue cables)
- +12 VDC (one red cable)
- -12 VDC (one blue cable)
- +75 VDC (one red and one blue cable)

The following requirements must be met:

- +6.30 VDC \pm 0.1 VDC
- +12.0 VDC \pm 0.1 VDC
- +75.0 VDC \pm 0.1 VDC

Procedure

WARNING

High voltages are used. This equipment must be serviced only by qualified personnel familiar with the construction and operation of the ME70, as well as the potential hazards involved. Failure to observe this precaution could result in bodily injury.

- 1 On the **Main** menu, set **Beam Mode** to *Test - Example 1*.
- 2 Open the **Operation** menu.
 - a Set **Operation** to *Normal*.
 - b Set **Range** to: *100 m*.
 - c Set **Ping** to *On*.
 - d Set **Ping Mode** to *Interval*.
 - e Set **Ping Interval** to *1 s*.
 - f Set **Tx Mode** to *Passive*
 - g Set **Tx Power** to *Off*.
- 3 Open the rear door on the Transceiver Unit.
- 4 Observe the terminal block on the left side of the cabinet.
- 5 Measure the individual voltages while the ME70 is operating normally.

Verify that the voltages are:

- +6.30 VDC \pm 0.1 VDC
- +12.0 VDC \pm 0.1 VDC
- +75.0 VDC \pm 0.1 VDC

6 Close the rear door on the Transceiver Unit.

Result

Requirements	Results
+6.30 VDC \pm 0.1 VDC	
+12.0 VDC \pm 0.1 VDC	
+75.0 VDC \pm 0.1 VDC	
Date and signature:	

Recording raw data

Use the raw data recording functionality provided by the ME70 to save echo data using the *.raw format. You can save the data to the Processor Unit hard disk, or onto an external storage device.

Prerequisites

The ME70 has been set up with its hardware units connected as specified in the ME70 *Installation manual*.

- If applicable: The transducer is replaced with a dummyload.
- The ME70 system is turned on and operates normally.

Neither tools nor instruments are required.

Context

The **Record** button allows you to start and stop recording. You can split the current recording file (if it gets too large), and set up the file output parameters. Once all the recording parameters have been defined, you can start and stop recording.

- To start recording, select the red circle on the right side of the button.
- To stop recording, select the black rectangle.
- Select the middle of the button to open it and access the available options.

Echo data files may be kept for future references. By means of the *Replay* function you can later play back the recorded file(s) on the ME70. This may prove useful if more a detailed study of the data is requested. You can also use the file(s) to experiment with the ME70 operational settings, as this will help you to gain more experience.

Procedure

- 1 If relevant, define the recording parameters.
- 2 On the **Main** menu, set **Beam Mode** to *Test - SAT Config*.
- 3 Open the **Operation** menu.
 - a Set **Operation** to *Normal*.
 - b Set **Range** to a suitable value..
 - c Set **Ping** to *On*.
 - d Set **Ping Mode** to *Interval*.
 - e Set **Ping Interval** to *1 s*.
 - f Set **Tx Mode** to *Active*
 - g Set **Tx Power** to *Maximum*.
- 4 To start data recording, open the **Record** button, and select *On*.
- 5 Allow the data recording to run approximately one minute.
- 6 Stop the recording.
- 7 Use a file manager, and verify that the recorded file(s) have been saved on the chosen disk.
- 8 Set **Operation** to *Replay*.

The replay bar opens automatically. It is positioned directly below the top bar at the top of the ME70 presentation.
- 9 Under **Operation**, select **Replay File** to open the dialog box.
 - a Select **Add** to choose one or more replay files.

A standard operating system dialog box opens. It allows you to select which file(s) to replay.
 - b If you wish to replay the selected file(s) in an "endless" loop, select **Loop**.
 - c Select **OK** to save the selected settings and close the dialog box.
- 10 On the replay bar, select **Play/Pause** to start the playback.

Result

Requirements	Results
The raw data recording and playback is operational	
Date and signature:	

Customer acceptance form

Fill in and sign this form for formal acceptance of the Simrad ME70 system.

The Simrad ME70 system is (<i>tick relevant column</i>):		
Accepted	Accepted with comments	Not accepted
Vessel/Customer		
Place and date		
Comments		
Test done by (name)	Company/Position	Date and signature
Test accepted by (name)	Company/Position	Date and signature
When this test procedure has been completed with all relevant signatures and applicable forms filled in, the document must be sent to the Simrad Support Department at Strandpromenaden 50, P.O.Box 111, 3191 Horten, Norway. Alternatively, scan all the pages to PDF using minimum 200 DPI resolution, and send the file to simrad.support@simrad.com .		

Secondary procedures

The end user and technical documentation for the ME70 contains several procedures that are also applicable for this Factory Acceptance Test. These procedures are not part of the Factory Acceptance Test. They are provided for reference purposes only. If you scan a completed Factory Acceptance Test for archiving or reporting purposes, it is not necessary to include these procedures.

Topics

[Turning on the ME70, page 39](#)

[Turning off the ME70, page 41](#)

[Checking the data transfer on an external interface line, page 42](#)

[Defining the file and folder settings for raw data recording, page 43](#)

Turning on the ME70

In order to use the ME70, you must first turn it on. You must first turn on the display and the Processor Unit. The remaining ME70 units are turned on from the ME70 program.

Prerequisites

The ME70 is installed as specified in the *ME70 Installation manual*.

The ME70 has been set up with its hardware units connected as specified in the *ME70 Installation manual*.

Context

The ME70 program is not automatically started when the Processor Unit is turned on. On the Processor Unit desktop, double-click the ME70 icon to start the program.

Caution

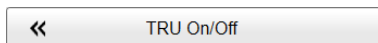
You must never turn on the ME70 when the ship is in dry dock. The transducer may be damaged if it transmits in open air. To prevent inadvertent use of the ME70, pull out the mains plug on the Processor Unit whenever your vessel is in dry dock. Additional precautionary measures should be considered.

Procedure

- 1 If your transducer is mounted on a drop keel, lower it.
- 2 Turn on the display. If required, refer to the instructions provided by the display manufacturer.
- 3 Turn on the Processor Unit. Wait while the operating system loads.
- 4 Double-click the icon on the Processor Unit desktop to start the program.
- 5 Once the ME70 program has started, observe that the presentation fills the entire screen. The ME70 starts up using the same settings as the last time you used it. If you wish to alter any of the settings, see the relevant procedures.
- 6 Select the **Setup** icon.

The icon is located under the **Main** menu. It is used to open the **Setup** menu.

- 7 Select **TRU On/Off** to open the dialog box.



- 8 In the **TRU On/Off** dialog box, select **Start**.
 - a Allow the three Power Supply Units and the Transceiver Unit to start up.
 - b Observe the status indicators in the **TRU On/Off** dialog box during the sequence.
 - c Verify that the ME70 does not issue any error messages.
 - d Close the dialog box.
- 9 On the **Main** menu, set **Beam Mode** to *Example 1 Sector Uniform Weighting*
- 10 Open the **Operation** menu.
 - a Set **Operation** to *Normal*.
 - b Set **Range** to: *100 m*.
 - c Set **Ping** to *On*.
 - d Set **Ping Mode** to *Interval*.
 - e Set **Ping Interval** to *1 s*.
 - f Set **Tx Mode** to *Active*

- g Set **Tx Power** to *Maximum*.
- 11 Observe that the ME70 starts.

Turning off the ME70

When you do not use the ME70, turn off the entire system. To power down the three Power Supply Units and the Transceiver Unit, use the functionality in the ME70 program.

Context

You must never turn off the ME70 by means of the on/off switch on the Processor Unit. You may damage the software and the interface settings used to communicate with external devices. You must always follow this procedure.

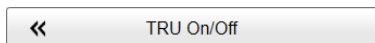
Note

Turning off the Processor Unit will not automatically turn off the Transceiver Unit and the three power supplies.

If the ME70 will remain unused for a longer period of time, disengage all the circuit breakers, and stop the ventilation fans for the sonar room. This will prevent dust from entering the Transceiver Unit.

Procedure

- 1 Open the **Operation** menu.
- 2 Choose these settings:
 - a Set **Operation** to *Inactive*.
 - b Set **Ping** to *Off*.
 - c Set **Tx Mode** to *Passive*
- 3 Open the **Setup** menu.
- 4 Select **TRU On/Off** to open the dialog box.



- 5 In the **TRU On/Off** dialog box, select **Shutdown**.
 - a Allow the three Power Supply Units and the Transceiver Unit to power down.
 - b Observe the status indicators in the **TRU On/Off** dialog box during the sequence.
 - c Verify that the ME70 does not issue any error messages.

- d Close the dialog box.
- 6 Select **Exit** on the top bar.
Observe that the ME70 program closes down.
- 7 If the Processor Unit does not turn itself off automatically, use the functionality provided by the operating system to turn it off manually.
- 8 Turn off the display.
If required, refer to the instructions provided by the display manufacturer.
- 9 If your transducer is mounted on a drop keel, retract it.

Checking the data transfer on an external interface line

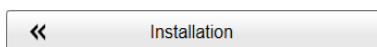
The communication between the Processor Unit and peripheral devices takes place using "datagrams". These datagrams are self-contained and independent entities of data carrying information. When setting up or maintaining the ME70, it is always useful to verify that the communication lines with external devices are operational.

Prerequisites

The relevant peripheral system is connected to the ME70 Processor Unit. The connection has been made using a serial or Ethernet communication port. All the relevant communication parameters have been defined. The peripheral system is turned on, and it transmits data.

Procedure

- 1 Open the **Setup** menu.
- 2 On the **Setup** menu, select **Installation**.



Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

- 3 On the left side of the **Installation** dialog box, select **I/O Setup**.
- 4 Make sure that the input port is functional.
 - a Select the relevant communication port.
 - b Select **Monitor** to open the **Port Monitor** dialog box.
 - c Make sure that there is data traffic on the input port (shown in the **Rx Data** box).

In order to see this data traffic, the peripheral system must be turned on, and transmitting information to the ME70.

- d If you are unable to see any data traffic on the communication port, we suggest the following:
 - 1 Make sure that the peripheral system has been turned on.
 - 2 Make sure that the peripheral system is in fact transmitting information.
 - 3 Make sure that the cable has been properly connected.
 - 4 Make sure that you have connected the peripheral system to the communication port that you are observing.
 - e Select **OK** to close the **Port Monitor** dialog box.
- 5 Make sure that each output port is functional.
- a Select the relevant communication port.
 - b Select **Monitor** to open the **Port Monitor** dialog box.
 - c Make sure that there is data traffic on the output port (shown in the **Tx Data** box).

In order to see this data traffic, your ME70 must be active and transmitting information to the peripheral system.
 - d If you are unable to see any data traffic on the communication port, we suggest the following:
 - 1 Make sure that the appropriate output data from your ME70 have been routed to the correct output port.
 - 2 Make sure that the output is enabled.
- 6 Select the [**X**] in the upper-right corner of the **Port Monitor** dialog box to close it.

Defining the file and folder settings for raw data recording

The ME70 allows you to record raw echo data. The data are saved on the Processor Unit hard disk, or on an external data storage device, according to the preferences you have defined.

Prerequisites

Before you start recording, make sure that you have defined where you wish to store the data files. If you wish to save your recorded data on an external hard disk, make sure that it is connected to the Processor Unit.

Context

The purpose of the **File Output** settings is to define the file and folder properties for the echo data files that are recorded by the ME70. You can select the disk and folder for the files, you can define the maximum file size, and you can choose a prefix for the file names.

Procedure

- 1 Open the **Operation** menu.
- 2 Locate the **Record** button.
- 3 Select the middle of the button to open it and access the available options.
- 4 Select **File Setup** to open the dialog box.



- 5 Open the **Raw Data** page.
 - a Click **Save raw data** to enable the recording function.
 - b Type a prefix into the **File name prefix** text field.
 - c Define the **Range** to collect echo data from.
 - d Define a limit (in nautical miles) for the maximum distance to be contained in one recorded file.

Set the value to 0 (zero) if you do not want any limit.
 - e In the **Max. file size** field, define a maximum size for the data files.

Set the value to 0 (zero) if you do not wish to limit the file size. The **Split File** function will start a new file with the next ping regardless of the maximum file size you have defined.

Note

The data files will normally become very large. If you wish to record large amounts of ME70 data, make sure that you have enough space on your hard disk. The ME70 is not provided with unlimited disk capacity. We recommend that you save the data files to an external storage device.

- f Observe the **Current file size** field.

The current size of the file you are recording is shown in this field. Data is only shown while recording is taking place.
 - g Select required sailing distance (in nautical miles) before raw data output is initiated.
- 6 Select **OK** to save the selected settings and close the dialog box.

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