



PHOENIX  
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# Test Report

Report Number:

**U200305E1**

Equipment under Test (EUT):

**R60 Basestation**

Applicant:

**Saab AB**

Manufacturer:

---



Deutsche  
Akkreditierungsstelle  
D-PL-17186-01-01  
D-PL-17186-01-02  
D-PL-17186-01-03

## References

- [1] **DIN EN 60945, Maritime navigation and radiocommunication equipment and systems -**  
 General requirements – Methods of testing and required test results  
 (IEC 60945:2002);  
 German version EN 60945:2002  
 Issue date: July 2003
- [2] **DIN EN 60068-2-30, Environmental testing –**  
 Part 2-30: Tests –  
 Test Db: Damp heat, cyclic (12 h + 12 h cycle)  
 (IEC 60068-2-30:2009);  
 German version EN 60068-2-30:2009  
 Issue date: June 2006
- [3] **R60 reduced Functional Test for Damp Heat re-test\***  
 Document ID: PT-20-0046  
 Issue: A1  
 Issue date: March 2020

\* This standard is not part of the accredited scope.

## Test Result

The complete test results are presented in the following.

tested and written by:	Sebastian FREIER		13.03.2020
	_____ Name	_____ Signature	_____ Date
reviewed and approved by:	Andreas BUDDE		13.03.2020
	_____ Name	_____ Signature	_____ Date

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The test results herein refer only to the tested sample. PHOENIX TESTLAB GmbH is not responsible for any generalisations or conclusions drawn from these test results concerning further samples. Any modification of the tested samples is prohibited and leads to the invalidity of this test report. Each page necessarily contains the PHOENIX TESTLAB Logo and the Test Report Number.

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# 1 Identification

## 1.1 Applicant

Name	Saab AB
Address	Låsblecksgatan 3, 589 41 Linköping
Country	Sweden
Applicant represented during the test by the following person	---

## 1.2 Manufacturer

Name	---
Address	---
Country	---
Manufacturer represented during the test by the following person	---

## 1.3 Test Laboratory

The tests were carried out by: **PHOENIX TESTLAB GmbH**  
**Königswinkel 10**  
**32825 Blomberg**  
**Germany**

Accredited by *Deutsche Akkreditierungsstelle GmbH* in compliance with  
 DIN EN ISO/IEC 17025 under Reg. Nr. **D-PL-17186-01-03**.

## 1.4 EUT (Equipment Under Test)

Test object	R60 Basestation
PTL No.	200305-1

*Note: Phoenix Testlab GmbH does not select the samples used for testing. The samples are provided exclusively by the customer.*

## 1.5 Dates

Date of receipt of test sample	30.10.2020
Start of test	10.03.2020
End of test	11.03.2020

## 2 Overview

### 2.1 Test procedure

**Table 1: Test procedure**

Norm	Test	Testing period
DIN EN 60945	Visual inspection & Functional test	10.03.2020 – 11.03.2020
	Damp heat	
	Visual inspection & Functional test	

*Note: The functional tests will carry out with a monitoring system provided by the applicant and according to "R60 reduced Functional Test for Damp Heat re-test".*

## 2.2 Damp heat

Test Db: Damp heat, cyclic / EN 60068-2-30

The EUT shall be placed in a test chamber at room temperature. The temperature shall then be raised to + 40 °C  $\pm$  2 °C, and the relative humidity raised to 93 %  $\pm$  3 % over a period of 3 h  $\pm$  0.5 h. These conditions shall be maintained for a period of 10 h to 16 h. Any climatic control devices provided in the EUT may be switched on at the conclusion of this period.

The EUT shall be switched on 30 minutes later, or after such a period as agreed by the manufacturer, and shall be kept operational for at least 2 h during which period the EUT shall be subjected to a performance check as specified in the relevant equipment standards.

The temperature and relative humidity of the chamber shall be maintained as specified during the whole test period. At the end of the test period and with the EUT still in the chamber, the chamber shall be brought to room temperature in not less than 1 h. At the end of the test the EUT shall be returned to normal environmental conditions.

The functional test before, during and after the test will carry out with a monitoring system provided by the applicant and according to "R60 reduced Functional Test for Damp Heat re-test".

**Table 1: Severity; Damp heat according to DIN EN 60945**

Temperature	+40 °C $\pm$ 2 °C
Rel. humidity	93 % $\pm$ 3 %
Test period	16 h

### 3 Results

**Table 2: Test results**

Norm	Test	Number of EUTs	Requirements
DIN EN 60945	Damp heat	1	Pass

Note: <sup>1)</sup> For the detailed results see the following pages.

The represented pass / fail assessment only relates to the functional test description according to the "R60 reduced Functional Test for Damp Heat re-test".

#### 3.1 Damp heat test

Requirements:

- Visual inspection for mechanical damages
- Faultless function before, during and after the test

**Table 3: Results, Damp heat**

EUT	Function before test	Function during the test	Function after test	Visual inspection after test
200305-1	Pass <sup>1)</sup>	Pass <sup>1)</sup>	Pass <sup>1)</sup>	Pass

Note: <sup>1)</sup> Before, during and after the test a functional test was carried out with a monitoring system provided by the applicant according to "R60 reduced Functional Test for Damp Heat re-test".

The represented pass / fail assessment only relates to the functional test description according to the "R60 reduced Functional Test for Damp Heat re-test".

The final evaluation of the EUT and the measured data will be carried out by the applicant and not by the testing body, PHOENIX TESTLAB GmbH.

## 4 Measuring equipment

**Table 4: Measuring equipment**

Measuring Instruments	Type	PM No.	Last Calibration	Next Calibration
Climatic test chamber	KS 600/75	490081	January 2020	January 2021

Note: *The QM-Manual of PHOENIX TESTLAB regulates the calibration of the measuring equipment. All listed measuring equipment is traceable calibrated according to national or international standards. Measurement uncertainty is calculated according to GUM.*

**Table 5: Measuring equipment provided by the applicant**

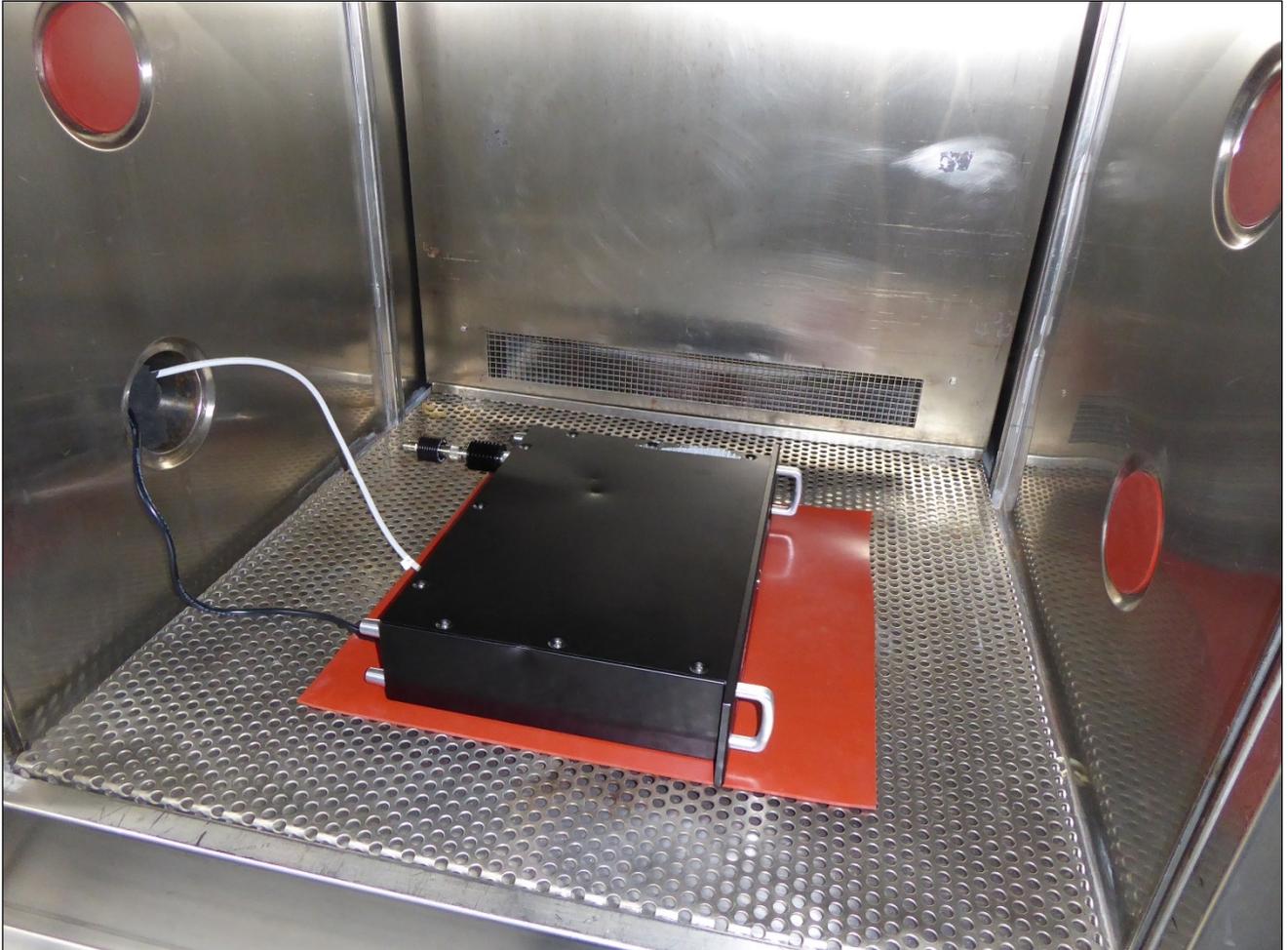
Measuring Instruments	Marking	Number of items
R60 Base-station	STT-1	1
AC power supply cable to base station	STT-5	1
10m Cat. 6 Ethernet RJ45 cable	STT-9	1
3m Cat. 6 Ethernet RJ45 cable	STT-10	1
30dB Attenuator with N-type connector	STT-13	1
Laptop PC containing the R60 Radiotest software	STT-16	1
Laptop PC power supply	STT-17	1

## 5 Pictures

Picture 1: Test Setup – Damp heat test



**Picture 2: Test Setup – Damp heat test**

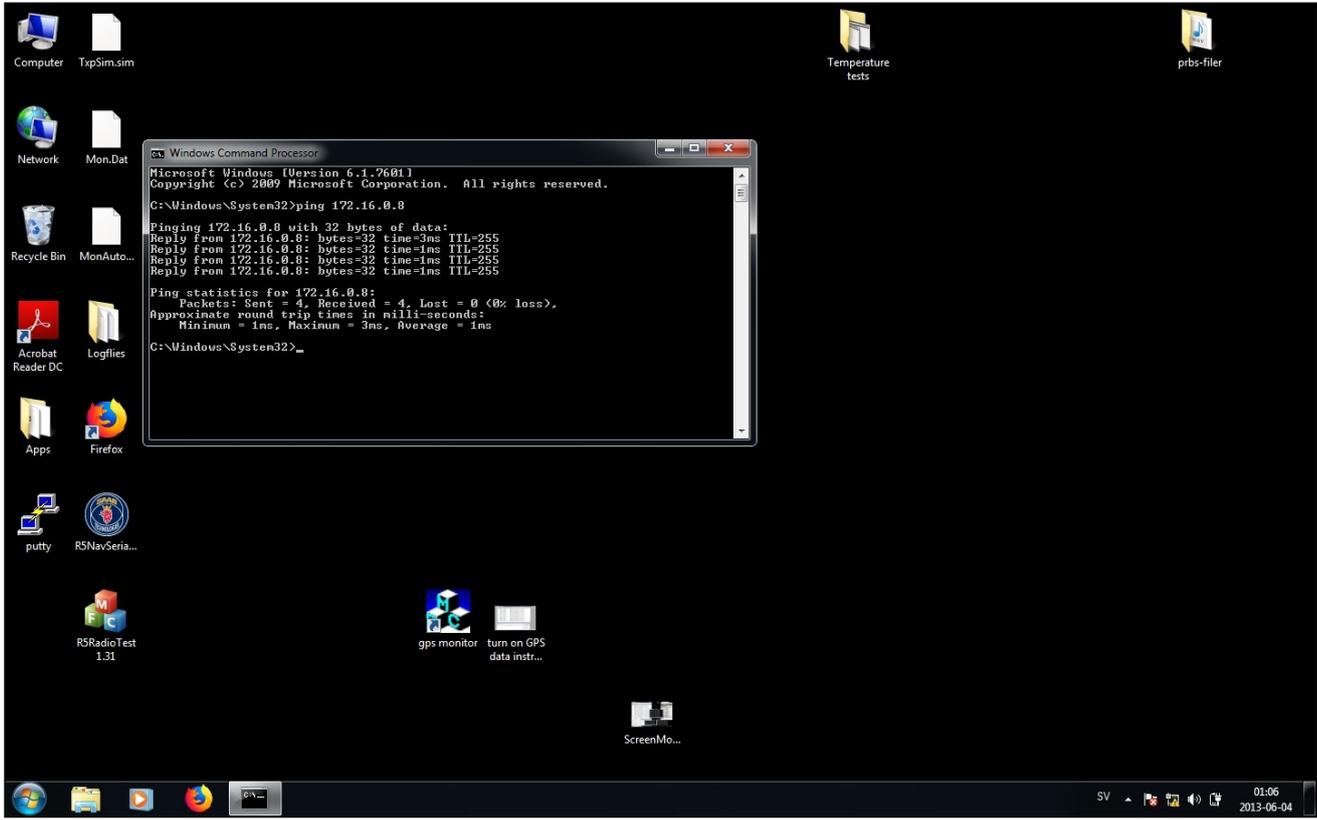


**Picture 3: Test Setup – Damp heat test**

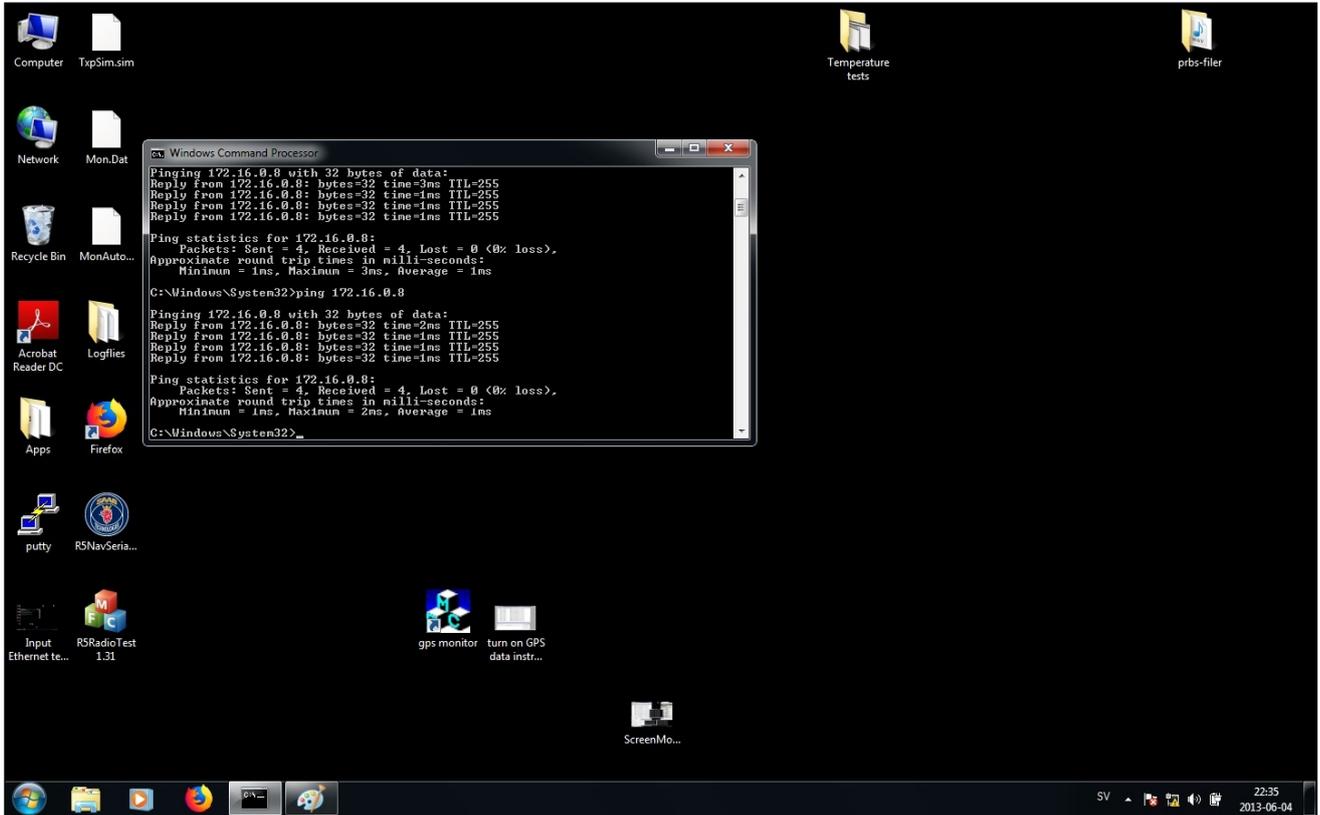


## 6 Screenshots Functional tests

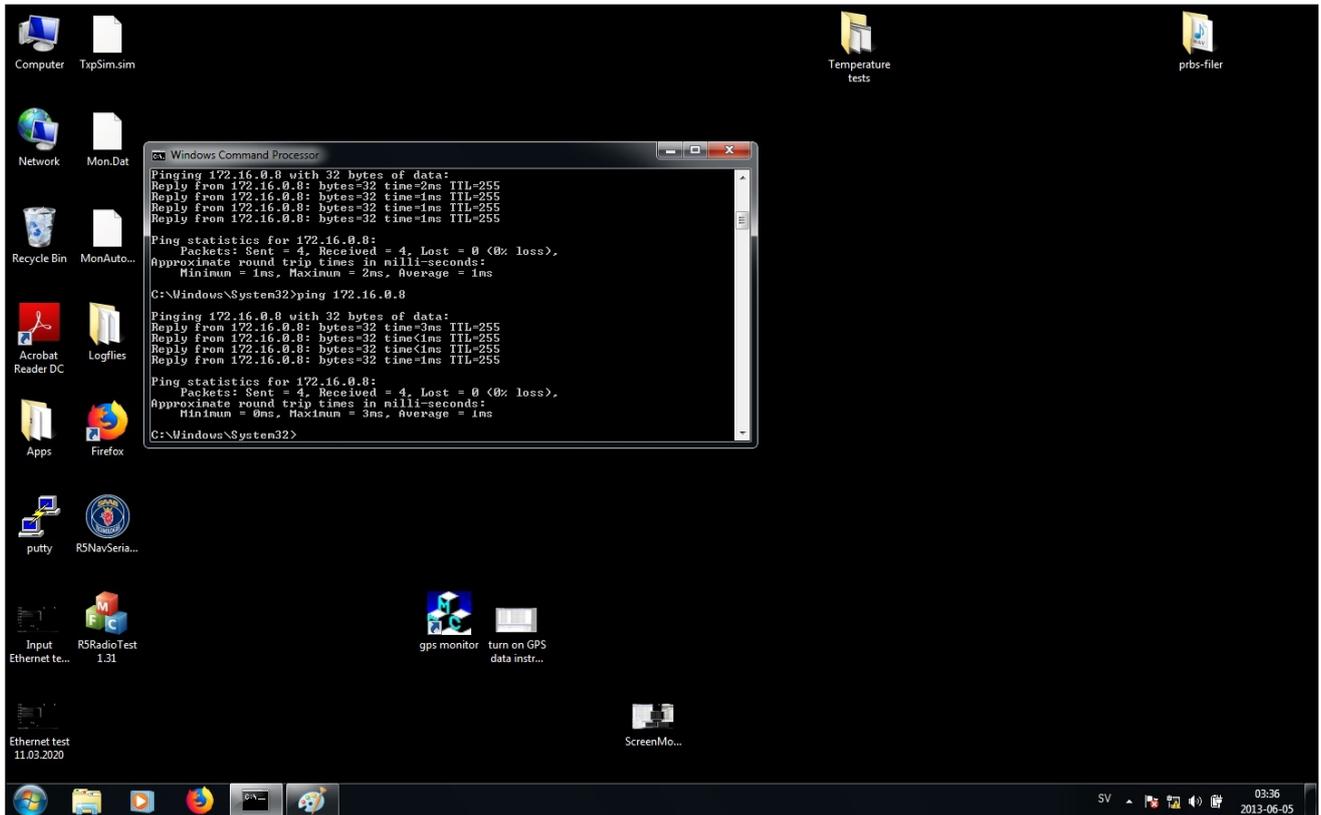
Picture 4: Before Damp heat



Picture 5: During Damp heat

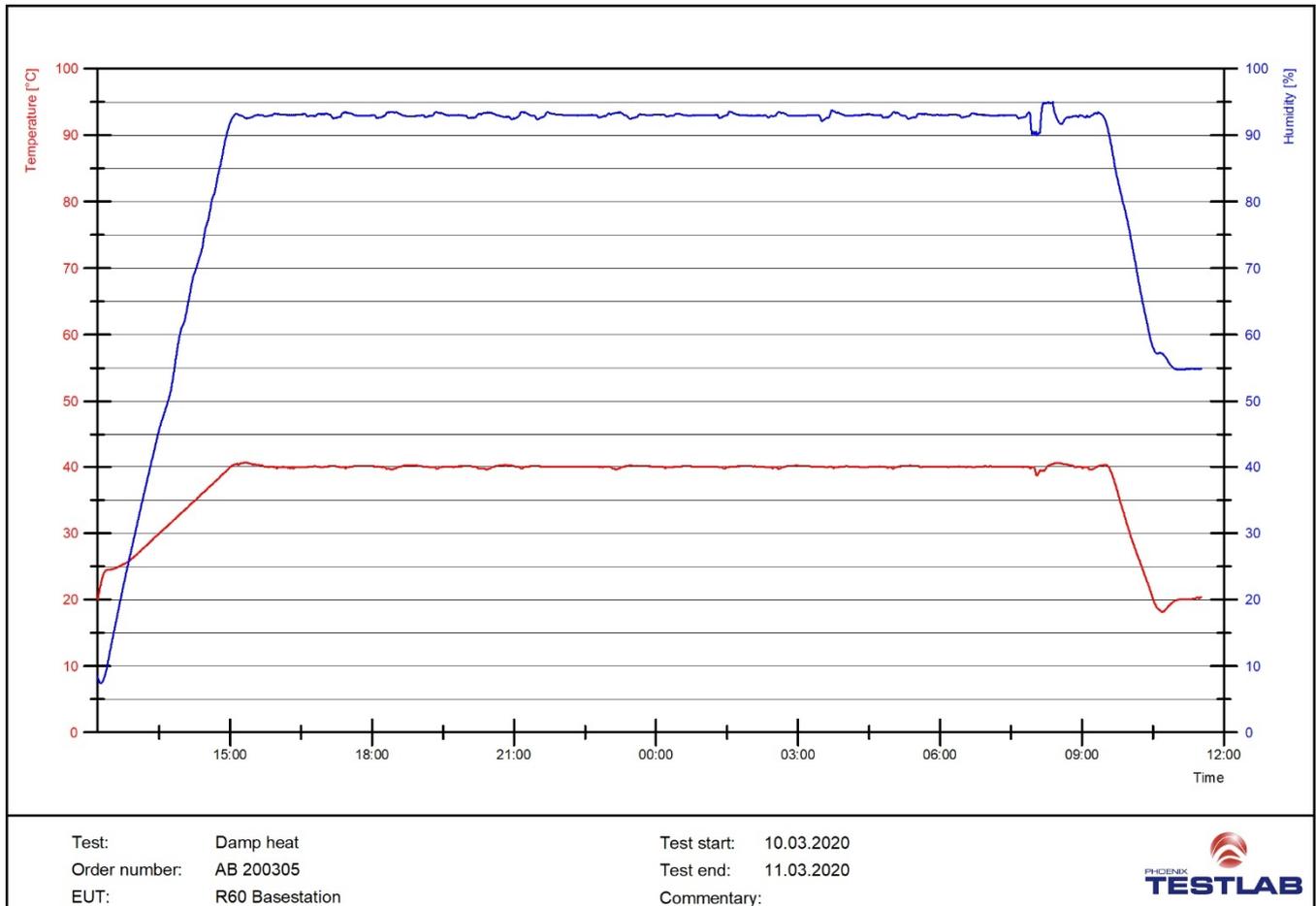


Picture 6: After Damp heat



## 7 Diagrams

Diagram 1: Temperature profile, Damp heat test



Note: At about 8:30 am, the chamber was opened to start the EUT for the functional test.

## 8 R60 reduced Functional Test for Damp heat re-test



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Classification Defence Secrecy  
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### R60 reduced Functional Test for Damp Heat re-test

#### 1 Equipment

Number of items	Marking	Description
1	STT-1	R60 Base-station
1	STT-5	AC power supply cable to base-station
1	STT-9	10m Cat. 6 Ethernet RJ45 cable
1	STT-13	30dB Attenuator with N-type connector
1	STT-16	Laptop PC containing the R60 Radiotest software
1	STT-17	Laptop PC power supply

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## 2 Scope

Reduced functional test, based on Ref. <PT-19-0087, B1, R60 Base Station Functional Test Instruction>. With the purpose of adapting required effort for re-test of Damp Heat, to demonstrate ETH3 communication during test.

## 3 Equipment setup

The standard setup is described below.

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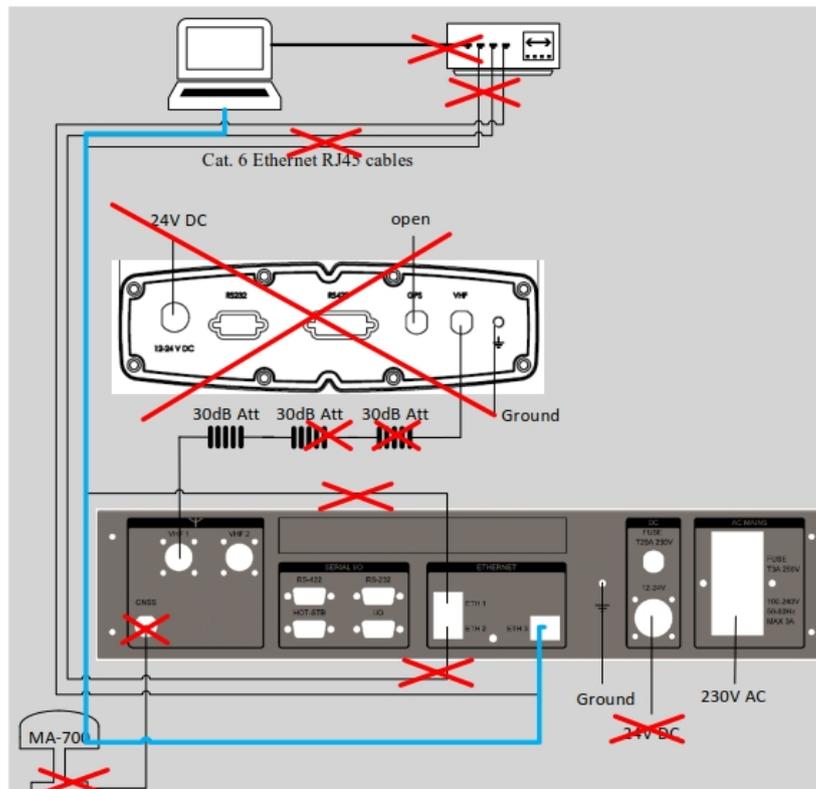


Figure 1, R60 Base-station equipment setup (modified from original test setup)

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#### Connections:

1. Connect the **R60 Base-station ground** to ground.
2. Connect a 30dB attenuator to the VHF1 port.
3. Connect 10m Ethernet cable between Laptop PC and ETH3.
4. Connect the **R60 Base-station AC MAINS, 100-240V** to 230V AC.

#### 4 Verification of operation

The function of the R60 Base-station can be verified with the method described in the sections below.

Start the **R60 Base-station** by switching the button on the left backside corner, **AC MAINS**.

**Note that R60 display software can sometimes hang at power-on. This can be observed as the power button ring lighting up solid green very quickly (<3 seconds) after power-on (normally the ring should fade in colour right after power-on). If this happens power must be cycled or parts of the verifications below will fail.**

**Note that sometimes it can take up to 2min from power-up before the R60 Base-station is operative.**

##### 4.1 Verification of interfaces

###### 4.1.1 Ethernet interfaces

Start a terminal window on the Laptop.

Press **Start** in the lower left corner. Type **cmd** followed by enter. Write the following commands:

```
ping 172.16.0.8
```

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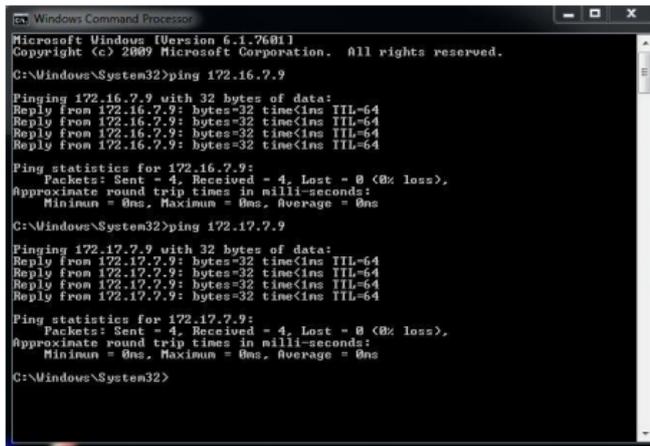


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```

Windows Command Processor
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Windows\System32>ping 172.16.7.9

Pinging 172.16.7.9 with 32 bytes of data:
Reply from 172.16.7.9: bytes=32 time<ins TTL=64

Ping statistics for 172.16.7.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Windows\System32>ping 172.17.7.9

Pinging 172.17.7.9 with 32 bytes of data:
Reply from 172.17.7.9: bytes=32 time<ins TTL=64

Ping statistics for 172.17.7.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Windows\System32>
    
```

**Functional criteria:** There should not be any lost packages on the tested interface.

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## 12 Report History

Report Number	Date	Commentary
U200305E1	13.03.2020	Document generated