

RADIO TEST REPORT

For

OneAudio Co., Ltd

Headphone

Test Model: S1

Additional Model No.: Please Refer to Page 6

Prepared for : OneAudio Co., Ltd
Address : 603 Jiazhaona Creative Building,
5010 Baoan Road, ShenZhen, GuangDong, China

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Date of receipt of test sample : August 04, 2020
Number of tested samples : 1
Serial number : Prototype
Date of Test : August 04, 2020 ~ August 07, 2020
Date of Report : August 13, 2020

RADIO TEST REPORT**MIC Notice No.88 Appendix No. 43**

Second-Generation Low-Power Data Communication System/Wireless LAN System

Report Reference No. : **LCS200720190AEA**

Date of Issue : August 13, 2020

Testing Laboratory Name..... : **Shenzhen LCS Compliance Testing Laboratory Ltd.**

Address : Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

Testing Location/ Procedure..... : Full application of Harmonised standards
Partial application of Harmonised standards
Other standard testing method **Applicant's Name** : **OneAudio Co., Ltd**

Address : 603 Jiazhaona Creative Building, 5010 Baoan Road, ShenZhen, Guang Dong, China

Test Specification

Standard : MIC Notice No.88 Appendix No.43

Test Report Form No. : LCSEMC-1.0

TRF Originator : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF..... : Dated 2011-03

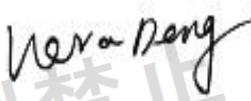
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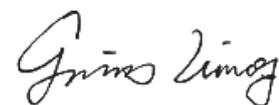
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Test Item Description..... : **Headphone**

Trade Mark : SuperEQ

Test Model..... : S1

Ratings : Input: DC 5V
DC 3.7V by Rechargeable Li-ion Battery (380mAh)Result : **Positive****Compiled by:****Supervised by:****Approved by:**




Vera Deng/ File administrators

Jin Wang/ Technique principal

Gavin Liang/ Manager

RADIO -- TEST REPORT

Test Report No. : LCS200720190AEA	<p style="text-align: right;">August 13, 2020</p> <p style="text-align: right;">Date of issue</p>
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<p>Test Model..... : S1</p> <p>EUT..... : Headphone</p>
<p>Applicant..... : OneAudio Co., Ltd</p> <p>Address..... : 603 Jiazhaona Creative Building, 5010 Baoan Road, ShenZhen, Guan gDong, China</p> <p>Telephone..... : /</p> <p>Fax..... : /</p>
<p>Manufacturer..... : Yenona Audio Co., Ltd</p> <p>Address..... : 301,Factory Building A, No.2 Shichang Road, Sangyuan, Dongcheng Sub-District, Dongguan City, Guangdong Province, China</p> <p>Telephone..... : /</p> <p>Fax..... : /</p>
<p>Factory..... : /</p> <p>Address..... : /</p> <p>Telephone..... : /</p> <p>Fax..... : /</p>

Test Result	Positive
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Revision History

Revision	Issue Date	Revisions	Revised By
000	August 13, 2020	Initial Issue	Gavin Liang

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1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	: Headphone
Test Model	: S1
Additional Model No	: S2, S3, S4, S5, S6, S7, S8, S9, S10
Model Declaration	: PCB board, structure and internal of these model(s) are the same, So no additional models were tested
Power Supply	: Input: DC 5V DC 3.7V by Rechargeable Li-ion Battery (380mAh)
Hardware Version	: H876-04-V0C
Software Version	: H876-08(BES23000Y)_V0D_XXX_EN_20_06_25

Bluetooth

	: 2402-2480MHz for Bluetooth (79 channels for Bluetooth V5.0(BDR/EDR)
Frequency Range	: Channel Frequency=2402+(K-1), K=1, 2, 379 40 channels for Bluetooth V5.0(BT LE) Channel Frequency=2402+2(K-1), K=1, 2, 340
Declared Antenna Power	: Bluetooth V5.0(BDR/EDR): 0.05mW/MHz Bluetooth V5.0(BT LE): 1.5mW
Modulation Technology	: Bluetooth V5.0(BDR/EDR): GFSK, $\pi/4$ -DQPSK, 8-DPSK Bluetooth V5.0(BT LE): GFSK
Data Rate	: Bluetooth V5.0(BDR/EDR): 1/2/3Mbps Bluetooth V5.0(BT LE): 1Mbps
Antenna Description	: PCB Antenna, 2.93dBi(Max.)

1.2. Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	Certificate
--	--	--	--	--

1.3. External I/O Cable

I/O Port Description	Quantity	Cable
Micro USB Port	1	N/A

1.4. Description of Test Facility

NVLAP Accreditation Code is 600167-0.

FCC Designation Number is CN5024.

CAB identifier is CN0071.

CNAS Registration Number is L4595.

1.5. Test Conditions

Temperature Range	:	21-25℃
Humidity Range	:	45-85%
Pressure Range	:	86-106kPa

1.6. Frequency of Channels

Bluetooth V5.0 (BDR/EDR)

Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	2402	41	2442
2	2403	42	2443
--	--	--	--
38	2439	78	2479
39	2440	79	2480
40	2441		

2. TEST METHODOLOGY

2.1. EUT Exercise

The EUT was tested while in a continuous transmitter/receiver mode.

The EUT was tuned to a low, middle, and high channel for the purpose of the measurements.

For all test case pre/scans were completed in all Modes to determine worst case levels.

According to its specifications, the EUT must comply with the requirements of MIC Notice No.88 Appendix No. 43.

2.2. Measurement Uncertainty

Test Item	MU	Remark
Bandwidth	+/- 0.2 E-6	/
Antenna Power	+/-0.33dB	/
Frequency Tolerance	+/- 0.3 E-6	/
Conducted spurious emission	+/-0.13dB	/
DC Power	+/-1%	/

- (1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2.3. Table for Parameters of Test Software Setting

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Power Parameters:

Test Software Version	RF_Tool_V5.2.1.21		
Frequency	2402MHz	2441MHz	2480MHz
Bluetooth V5.0	Default	Default	Default

2.4. Description of Test Modes

Tested channel, Frequency and Modulation Information		
CH1	2402MHz	GFSK(1Mbps), $\pi/4$ -DQPSK(2Mbps), 8-DPSK(3Mbps)
CH40	2441MHz	GFSK(1Mbps), $\pi/4$ -DQPSK(2Mbps), 8-DPSK(3Mbps)
CH79	2480MHz	GFSK(1Mbps), $\pi/4$ -DQPSK(2Mbps), 8-DPSK(3Mbps)
Hopping Mode		GFSK(1Mbps), $\pi/4$ -DQPSK(2Mbps), 8-DPSK(3Mbps)

Note: According exploratory test, EUT has maximum output power for GFSK modulation, All the test modes were tested, but only the worst case was recorded in this report.

2.5. Test Voltage

POWER SUPPLY VOLTAGE FLUCTUATION TEST

Environment	Input Voltage(DC)
-10%	DC 3.3V
Normal	DC 3.7V
+10%	DC 4.2V

3. SYSTEM TEST CONFIGURATION

3.1. Justification

The system was configured for testing in a typical fashion.

3.2. EUT Exercise Software

N/A.

3.3. Special Accessories

N/A.

3.4. Block Diagram/Schematics

Please refer to the report.

3.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

4. SUMMARY OF TEST RESULTS

MIC Notice No.88 Appendix No.43 Article 2 Paragraph 1 Item 19		
Clause	Description of Test (Transmitter Parameters)	Result
6	Antenna Power	PASS
6	Tolerances for Antenna Power	PASS
3	Frequency Tolerance	PASS
4	Transmission Rate	PASS
4	Occupied Frequency Bandwidth	PASS
4	Spread Bandwidth	PASS
13	Dwell Time	PASS
5	Spurious Emissions	PASS
10	Transmission Antenna Gain (EIRP Antenna Power)	PASS
11	Transmission Radiated Angle Width (3dB Beam width)	N/A
12	Interference prevention function	PASS
8	Carrier Sensing function	N/A
Receiver Parameters		
7	Secondary Radiated Emissions	PASS
(1) N/A is an abbreviation for Not Applicable.		

5. TEST RESULT

5.1. Antenna Power

5.1.1. Standard Applicable

Type	Limit
Antenna Power	3mW/MHz
Tolerance	+20%,-80%

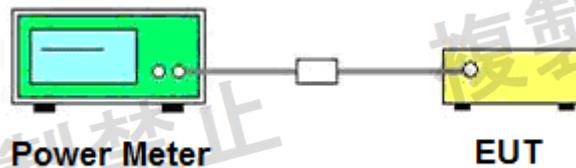
5.1.2. Measuring Instruments

Please refer to section 6 of equipments list in this report.

5.1.2. Test Procedures

- EUT have transmitted continuous maximum power
- Antenna Power Error is definition that actual measure antenna power tolerance between +20% to -80% power range that base on manufacturer declare the conducted power density.

5.1.3. Test Setup



5.1.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.1.5. Test Result

Please refer to the Appendix A.1 for BT Test Data.

5.2. Frequency Tolerance

5.2.1. Standard Applicable

Tolerance of frequency shall be ± 50 ppm.

5.2.2. Test Procedures

- a. Set EUT work in test mode as described in clause 2.4.
- b. Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Centre Frequency: The centre frequency of the channel under test.

Resolution BW: 10 KHz.

Video BW: 10 KHz.

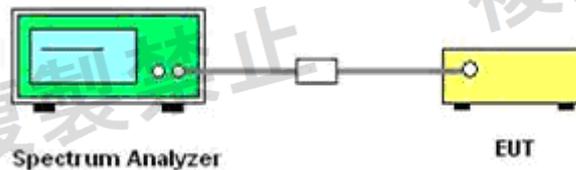
Span: 1MHz.

Detector: Peak.

Trace Mode: Max Hold.

- c. When the trace is complete, find the peak value of the power envelope and record.

5.2.3. Test Setup Layout



5.2.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.2.5. Test Result

Please refer to the Appendix A.2 for BT Test Data.

5.3. Occupied Frequency Bandwidth

5.3.1. Standard Applicable

Permissible value for occupied bandwidth using the FH system, a hybrid system combining DS and FH systems, or a hybrid system combining FH and OFDM systems shall be 83.5 MHz or less, while necessary bandwidth (minimum occupied bandwidth sufficient to ensure information transmission of required quality at a required transmission rate for the system used under specified conditions for a given emission type) using a system other than any of the above shall be 26 MHz or less.

5.3.2. Test Procedures

- Set EUT work in test mode as described in clause 2.4.
- Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Centre Frequency: The centre frequency of the channel under test.

Resolution BW: 1MHz.

Video BW: 1MHz.

Span: Wide enough to cover the complete power envelope of the signal of the EUT.

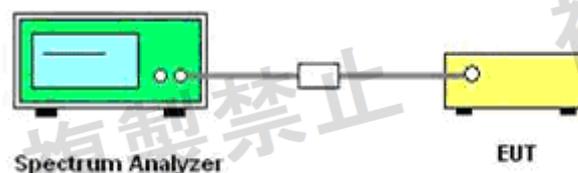
Sweep mode: Continuous sweeping.

Detector: Peak.

Trace Mode: Max Hold.

- When the trace is complete, measure the occupied bandwidth (99% bandwidth) with spectrum analyzer's bandwidth measure function.

5.3.3. Test Setup Layout



5.3.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.3.5. Test Result of Occupied Bandwidth

Please refer to the Appendix A.3 for BT Test Data.

5.4. Spread Bandwidth

5.4.1. Standard Applicable

In spread spectrum systems, spread bandwidth (which refers to a frequency bandwidth with an upper limit and lower limit such that each of the mean powers radiated above the upper frequency limit and below the lower frequency limit is equal to 5 % of the total mean power radiated; this also applies hereafter) shall be 500 kHz or more.

The OFDM system shall have one or more carriers per 1 MHz bandwidth.

5.4.2. Test Procedures

a. Set EUT work in test mode as described in clause 2.4.

b. Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Centre Frequency: The centre frequency of the channel under test.

Resolution BW: 1MHz.

Video BW: 1MHz.

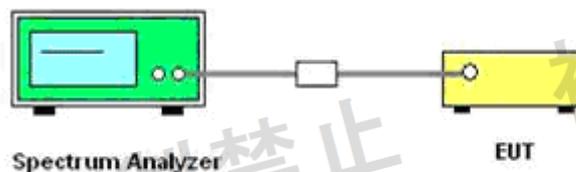
Span: Wide enough to cover the complete power envelope of the signal of the EUT.

Detector: Peak.

Trace Mode: Max Hold.

c. When the trace is complete, measure the spread bandwidth (90% bandwidth) with spectrum analyzer's bandwidth measure function.

5.4.3. Test Setup Layout



5.4.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.4.5. Test Result of Spectrum Bandwidth

Please refer to the Appendix A.4.1 for BT Test Data.

5.4.6. Test Result of Spread Spectrum Factor

Please refer to the Appendix A.4.2 for BT Test Data.

5.5. Dwell Time

5.5.1. Standard Applicable

Frequency dwell time (time during which radio waves continue to be emitted at a specified frequency) of a transmitting equipment using the FH system shall be 0.4 seconds or less.

5.5.2. Test Procedures

- a. Set EUT work in test mode as described in clause 2.4.
- b. Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Centre Frequency: The centre frequency of the channel under test.

Resolution BW: 1MHz.

Video BW: 1MHz.

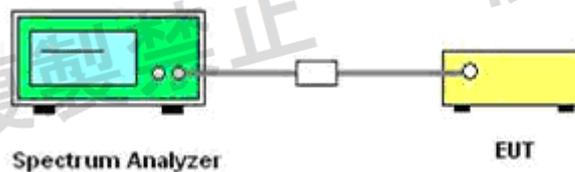
Span: Zero MHz

Detector: Peak.

Trace Mode: Max Hold.

- c. When the trace is complete, measure the sending time of 1 burst and the duty cycle of 1 burst cycle.

5.5.3. Test Setup Layout



5.5.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.5.5. Test Results

Please refer to the Appendix A.5 for BT Test Data.

5.6. Transmitter Spurious Emissions (conducted)

5.6.1. Standard Applicable

Permissible mean power of spurious emission of each frequency supplied to a feeder, that is, mean power of spurious emission in the 1 MHz bandwidth at frequency f other than frequency band used shall be as follows:

- | | |
|---|----------------------------|
| a. $30\text{MHz} \leq f \leq 1,000\text{MHz}$ | 0.25 μW or less |
| b. $2,387\text{MHz} \leq f \leq 2,400\text{MHz}$ and $2,483.5\text{MHz} < f \leq 2,496.5\text{MHz}$ | 25 μW or less |
| c. $2,387\text{MHz} > f$ and $2,496.5\text{MHz} < f$ | 2.5 μW or less |

5.6.2. Test Procedures

- Set EUT work in test mode as described in clause 2.4.
- Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Centre Frequency: The centre frequency of the channel under test.

Below 1GHz: RBW/VBW= 100 KHz/ 100KHz

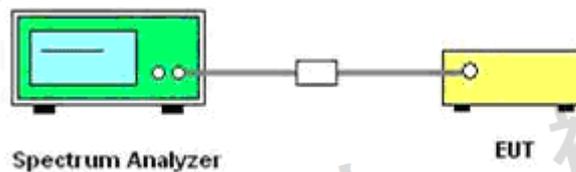
Above 1GHz: RBW/VBW= 1MHz / 1MHz.

Detector: Peak.

Trace Mode: Max Hold.

- All the emissions from 30MHz to 13GHz were measured and record.

5.6.3. Test Setup Layout



5.6.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.6.5. Test Results

Please refer to the Appendix A.6 for BT Test Data.

5.7. Carrier sensing function

5.7.1. Standard Applicable

Item	Limits
Carrier Sense	Good – EUT stop RF transmission signal after carrier inject to EUT. (On $22.79+Gr-20*\log(f)$ [dBm] (Gr: dBi; f: MHz) or 100mV/m)

5.7.2. Instruments Setting

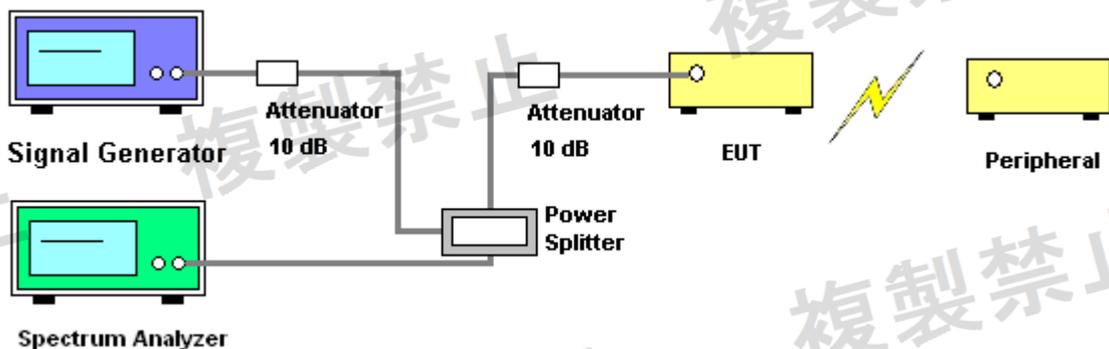
The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	1 MHz
Span	0 MHz
Sweep	Continuous
Detector	Peak
Trigger mode	Video

5.7.3. Test Procedures

1. SSG adjusted the frequency as same as the EUT transmitted signal and emitted the absence of modulation from SSG and power level is $(On\ 22.79+Gr-20*\log(f)\ [dBm])$ (Gr: dBi; f: MHz). Then turn off the RF signal of SSG.
2. EUT have transmitted the maximum modulation signal and fixed channelize.
3. Setting of SA is following as: RB: 1MHz / VB: 1MHz / SPAN: 50MHz / AT: 10dB / Ref: 0dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak.
4. SSG RF Signal On.
5. EUT shall be stop the transmitted any signal and SSG RF Signal Off. Then EUT will be continuous transmitted signal.

5.7.4. Test Setup Layout



5.7.5. EUT Operation during Test

The EUT was programmed to be in normal transmitting mode.

5.7.6. Test Result

Not Applicable.

5.8. Interference prevention function

5.8.1. Standard Applicable

Item	Limits
Identification code	≧ 48 bits

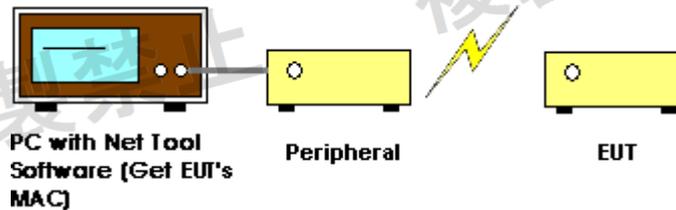
5.8.2. Measuring ID Code Software

PC with NetTool	Setting
MAC IP List	MAC Scan

5.8.3. Test Procedures

1. In the case that the EUT has the function of automatically transmitting the identification code:
 - a. Transmit the predetermined identification codes from EUT. b. Check the transmitted identification codes with the demodulator.
2. In the case of receiving the identification code:
 - a. Transmit the predetermined identification codes from the counterpart. b. Check if communication is normal. c. Transmit the other signals than predetermined ID codes from the counterpart. d. check if the EUT stops the transmission, or if it displays that identification codes are different from the predetermined ones.

5.8.4. Test Setup Layout



5.8.5. EUT Operation during Test

The EUT was programmed to be in normal transmitting mode.

5.8.6. Test Result

EUT ID	Performance index
60:ab:67:f0:90:fc	Good

5.9. Secondary Radiated Emissions

5.9.1. Standard Applicable

The limit on secondary emissions radiated from the receiving equipment within which the function of other radio equipment will not be impaired shall be, in terms of the power of a dummy antenna circuit that has the same electrical constant as the receiving antenna, 4nW or less at a frequency below 1 GHz and 20nW or less at a frequency of 1 GHz or higher as measured using the circuit

5.9.2. Test Procedures

- a. Set EUT work in test mode as described in clause 2.4.
- b. Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Resolution BW: 100 KHz for frequency below 1GHz and
1MHz for frequency above 1GHz

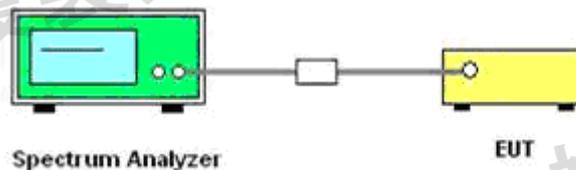
Video BW: 100 KHz for frequency below 1GHz and
1MHz for frequency above 1GHz

Detector: Peak.

Trace Mode: Max Hold.

- c. All the emissions from 30MHz to 13GHz were measured and record.

5.9.3. Test Setup



5.9.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.9.5. Test Results

Please refer to the Appendix A.7 for BT Test Data.

6. PHOTOGRAPHS OF TEST SETUP

Please refer to separated files Appendix D for Test Setup Photographs

7. EXTERNAL PHOTOGRAPHS OF THE EUT

Please refer to separated files Appendix E for External Photos of EUT

8. INTERNAL PHOTOGRAPHS OF THE EUT

Please refer to separated files Appendix F for Internal Photos of EUT

9. LIST OF MEASURING EQUIPMENTS

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Power Meter	R&S	NRVS	100444	2020-06-22	2021-06-21
2	Power Sensor	R&S	NRV-Z81	100458	2020-06-22	2021-06-21
3	Power Sensor	R&S	NRV-Z32	10057	2020-06-22	2021-06-21
4	MXA Signal Analyzer	Agilent	N9020A	MY49100060	2019-11-22	2020-11-21
5	DC Power Supply	Agilent	E3642A	N/A	2019-11-14	2020-11-13

Note: All equipment is calibrated through CHINA CEPREI LABORATORY and GUANGZHOU LISAI CALIBRATION AND TEST CO., LTD.

-----THE END OF REPORT-----