FCC
Electromagnetic Compatibility
Test Report

For

3M™ Model 795 Digital Staff Workstation

Safety and Security Systems Division
Library Systems
St. Paul, MN 55144-1000

21 October 2002

Report Number F0902001

Prepared By:

CR-SEMS Product Safety
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CERTIFICATE OF COMPLIANCE

USA STANDARD 47 CODE OF FEDERAL REGULATIONS

Radiated Emissions (FCC Part 15, Subpart B, Class A)
Conducted Emissions (FCC Part 15, Subpart B, Class A)
Radiated Emissions (FCC Part 15, Subpart C)
Conducted Emissions (FCC Part 15, Subpart C)

MANUFACTURER'S NAME:	3M Company Safety and Security Systems Division Library Systems St. Paul, MN 55144-1000
NAME OF EQUIPMENT:	Digital Staff Workstation
MODEL NUMBER:	795
SERIAL NUMBER	7950013
TEST REPORT NUMBER:	F0902001
DATE:	21 October 2002

As the responsible EMC Project Engineer, I hereby declare that the equipment tested, as specified in the test report, at the 3M Product Safety EMC Laboratory is in compliance with 47 CFR, Part 15, Subpart B and Subpart C. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics.

Signatory: Roger Kuhn

Roger D. Kuhn
EMC Laboratory – Project Leader

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1.0 TEST SUMMARY

Test Report Number:	F0902001
Requester:	Ed Goff
Company:	3M Safety and Security Systems Division Library Systems Building 209 St. Paul, MN 55144
Telephone Number:	651 – 737-4736
Test Dates:	7 October 2002 through 17 October 2002
Equipment Under Test	Model 795 Digital Staff Workstation
Date Of Receipt:	18 September 2002
Test Environment	Temperature: 20 to 30 degrees C Relative Humidity: 30 to 70 % RH
Test Results:	Passed the following tests: Conducted Emissions: FCC Part 15 Subpart B Class A; Radiated Emissions: FCC Part 15 Subpart B Class A; Conducted Emissions: FCC Part 15 Subpart C; Radiated Emissions: FCC Part 15 Subpart C;
Modifications:	Modifications were required (See Paragraph 2.5)
Test Location:	3M Product Safety EMC Laboratory Building 76 410 Fillmore Ave. St. Paul, MN 55144-1000

2.0 INTRODUCTION

2.1 Scope

This report contains results describing the conformance of the Equipment Under Test (EUT) to FCC Part 15, Subpart B, "Class A" rules for unintentional radiators and FCC Part 15, Subpart C rules for intentional radiators.

This report is the confidential property of the client and applies only to the specific item tested under the stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics. This report shall not be reproduced without the written approval of the testing laboratory. When approval has been granted, the report shall be reproduced in its entirety.

The appropriate testing standards and references that were used are contained in Section 3.0. Worst-case test data, test configuration, and photographs (worst case configuration) are provided in the Appendices. Equipment and documentation labeling information is contained in Section 7.0.

Subsequent tests are necessary from time to time on equipment taken at random from production. Re-testing of the EUT is also required when the EMC profile has been changed or is suspected of being changed.

The 3M Product Safety EMC Laboratory is recognized under the United States Department of Commerce National Institute of Standards and Technology's National Voluntary Laboratory Program (NVLAP) for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQ Q92-1987) as suppliers of test results. Accreditation by the National Voluntary Laboratory Accreditation Program is awarded for specific services, listed on the Scope of Accreditation for: Electromagnetic Compatibility and Telecommunications, FCC, under Lab Code 200033. A complete copy of the Scope of Accreditation is available upon request. The FCC Site Registration Number is 93334.

The NVLAP accreditation or this test report does not in any way constitute or imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

2.2 EUT Description and Operation

The Equipment Under Test (EUT) is the 3M™ Model 795 Digital Staff Workstation, Serial Number 7950013.

The 3M™ Model 795 Digital Staff Workstation is designed and tested for use in processing identification tags and barcodes. The workstation:

1. Reads item identification or barcode information from existing media and passes it to the library terminal connected to the library circulation system, and
2. Secures or unsecures 3M™ Tattle-Tape™ Strips in items as required.

The product has not been tested or proven safe for other uses.

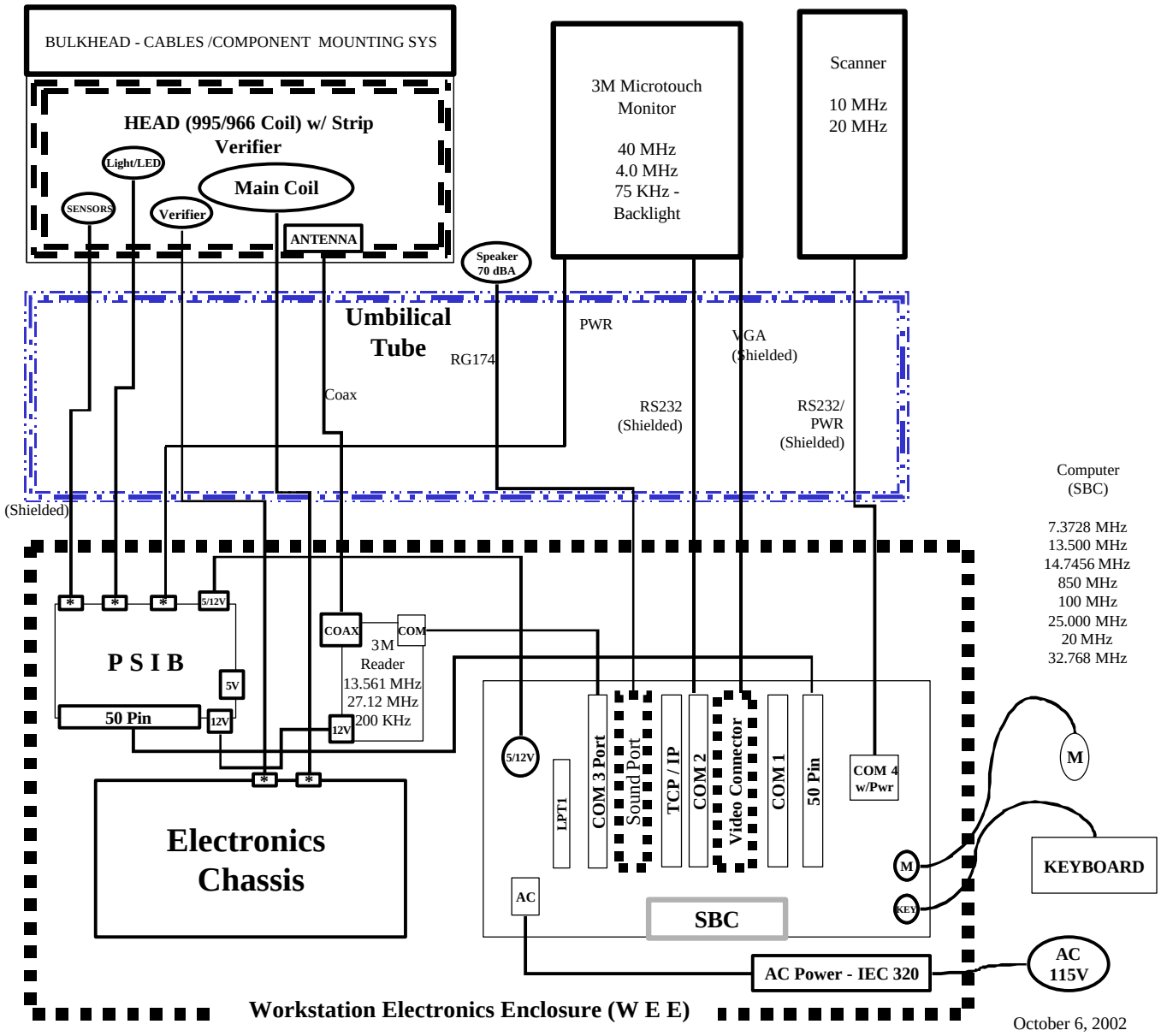
The reader has a transmit frequency of 13.5601 MHz. And a power output level of 0.400 watts (26 dBm) as measured into a 50-ohm load.

The EUT has an integral antenna with an area of 62.69 square inches (0.041 square meters). The antenna is adhered to the back of the sense/desense coil cover of the EUT and is connected to the reader via a coax cable employing SMC connectors.

All tests were made using an input of 120 V RMS, 60 Hz, and single-phase power. The EUT was tested with an EMC programs exercising all functions. The Reader was set to the fastest read time and was reading tags during all testing.

2.3 Block Diagram

Model 795 DSW System Block Diagram



2.4 Parts List

Description	Manufacturer	Model / Type	Remark
Computer (SBC)	SBS Micro Alliance Inc	200-S0076CA CA Rev. 4	78-8123-7443-3
Network Board Sound Board Video Board			Integrated into SBC
Dual Port Serial I/O Board	Blastronix	232/2s-PCI-SBS	
Sensor Board Driver	Blue Chip Technologies	PI048	
Keyboard	Ortek Technology	MCK-600W	FCC ID KJXMCK-701W
Mouse	Logitech	M-CAA42	FCC Tested to comply with FCC Standards for Home and Office Use
Display	3M Microtouch	41-9518-94-20	FCC Tested to comply with FCC Standards for Home and Office Use
Electronics Chassis V	3M	78-8118-7380-7	
Coil	3M	78-8118-7399-7	
PSIB (Photo Sensor Interface Board)	3M	78-8118-7601-6	
Item Sensors	3M 3M	78-8118-7662-8 78-8121-0792-0	
MDB Sensors	3M 3M	78-8118-7661-0 78-8121-0793-2	
RFID Reader	3M	Model 700	
Antenna	3M	78-8123-1707-7	
Bar Code Scanner	Accu-Sort Systems	22	
Verifier	3M	78-8123-1585-7	

2.5 Modifications to the EUT

The following modifications of the EUT were necessary to meet the test standards:

Equipment	Modifications	Where	Material	Turns
Power Supply Cable	Common Mode Choke	At PC near P/S Bd. Connector	Steward 28B2024-0A0	3 Turns
USB Cable	Common Mode Choke	At PC near USB Connector	Steward 28B2029-0A0	2 Turns
Mouse Cable	Common Mode Choke	At the output of the Mouse/Keyboard "Y" Connector	Steward 28B2029-0A0	2 Turns
Scanner Cable	Common Mode Choke	At PC near the Com 4 Connector	Steward 28B2029-0A0	1 Turn
Reader Cable (RS232)	Common Mode Choke	At Reader Near RS232 Connector	Steward 28B2024-0A0	2 Turns
Reader Power Supply Cable	Common Mode Choke	At Reader Near Power Supply Connector	Steward 28B2024-0A0	3 Turns
Reader Antenna Cable	Common Mode Choke	At Reader near Antenna Connector	Steward 28A2024-0A0	2 Turns
Ethernet Cable	Common Mode Choke	At PC near the Connector	Steward 28B2029-0A0	2 Turns
Head Assembly	Wire Routing	Wires to be routed away from "Figure 8" Coil and Tye-wrapped down.		
Verifier Light Cable	Use Shielded Cable from PSIB to Verifier Light	Shield to be grounded at PSIB		
3M Reader Board	Grounded board	Grounded board through the mounting screw to the mounting bracket at the center of the board through the plastic reader case		

2.6 Measurement Uncertainty

The data and test results referenced in this report are true and accurate. However, there may be deviations within the calibration limits of the test equipment and facilities that can account for a nominal measurement deviation of ± 2 dB. Furthermore, EUT component and manufacturing process variables may result in additional deviation. The calculated confidence level is 95 %.

3.0 APPLICABLE DOCUMENTS

The following documents were used as reference for the limits and test procedures specified herein.

CFR 47	Part 15 Radio Frequency Devices	2002
ANSI C63.4	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 KHz to 40 GHz.	2000
CISPR 16-1	Specification for radio disturbance and immunity measuring apparatus and methods Part 1: Radio disturbance and immunity measuring apparatus	1998
CISPR 16-2	Specification for radio disturbance and immunity measuring apparatus and methods Part 2: Methods of measurements of disturbances and immunity	1996

4.0 CONDUCTED EMISSIONS

Conducted emissions testing was performed in accordance with ANSI C63.4. The limits are prescribed in FCC Part 15, Subpart B and in FCC Part 15, Subpart C.

4.1 Test Procedure

The EUT was placed in a shielded chamber for the tests and tested while exercising all functions with a dummy load attached to the Reader output terminal (See ANSI C63.4-1992 Paragraph 13.1.3.1).

A Line Impedance Stabilization Network (LISN) with a 50 Ohm / 50 microHenry characteristic impedance was used to isolate the EUT and give accurate and repeatable readings. An EMI test receiver was used for the emissions measurements in the range from 450 KHz to 30 MHz. Initial sweep measurements were taken with the receiver in continuous frequency overview mode utilizing peak level signal detection. Acceptance analysis was preformed on the initial measurements to determine which discrete frequencies to maximize. These frequencies were remeasured utilizing quasi-peak detection. Measurement results were automatically calculated via software running the EMI receiver. The final quasi-peak measurements recorded were determined by the following formula:

Result (dBµV) = receiver reading (dBµV) + LISN CF (dB) + cable loss (dB)

4.2 Test Criteria

The FCC Part 15, Subpart B, "Class A" conducted limits are given below.

Frequency (MHz)	Limit Quasi-Peak (dBµV)
0.450 to 1.705	60.00
1.705 to 30.00	69.54

The FCC Part 15, Subpart C conducted limits are given below.

Frequency (MHz)	Limit Quasi-Peak (dBµV)
0.450 to 30.00	47.96

The lower limit shall apply at the transition frequency.

4.3 Test Results

The EUT met conducted emission requirements for FCC Part 15, Subpart B, "Class A" and met FCC Part 15, Subpart C. All the conducted emissions test data is shown in Appendix A. The worst-case peak and quasi-peak emissions were as follows:

Frequency (MHz)	Limit (dBµV)	L1- Line Q-P (dBµV)	L2 - Neutral Q-P (dBµV)	Passing Margin (dB)
13.5602	47.96	34.1	33.6	13.86

FCC Part 15, Subpart C limit is shown.

5.0 RADIATED EMISSIONS

Radiated emissions testing was performed in accordance with ANSI C63.4. The limits are prescribed in FCC Part 15, Subpart B and in FCC Part 15, Subpart C.

5.1 Frequency Stability

The Frequency Stability testing was preformed in accordance with ANSI C63.4 and FCC Part 15 to insure that the intentional radiator frequency stability was within the allowable limits for input power and temperature variations.

5.1.1 Test Procedure

The Frequency Stability was measured using the radiated signals from the EUT so that the measurement equipment would not load the radio frequency circuits. An EMI receiver was used for the frequency stability measurements. The Reader was put into a continuous output mode through instructions from the host computer (test mode of operation). 1) The frequency was measured while the input AC power to the External Power Supply was varied over the required input voltage range. 2) The frequency was also measured while the ambient air temperature was varied over the required ambient temperature range (at startup, 2 minutes, 5 minutes, and 10 minutes).

5.1.2 Test Criteria

The FCC Part 15, Subpart C for Frequency Stability Limits versus Supply Voltage is given below.

Carrier Frequency (MHz)	Voltage Range (% of Nominal Supply)	Max. Frequency Change (%)
13.56	85 % to 115 %, (102 to 138 V RMS)	+/- 0.01 %

The FCC Part 15, Subpart C for Frequency Stability Limits versus Temperature is given below.

Carrier Frequency (MHz)	Temperature Range (Degrees C)	Max. Frequency Change (%)
13.56	-20 to +50	+/- 0.01 %

5.1.3 Test Results

The EUT met the FCC Part 15, Subpart C Frequency Stability requirement.

Carrier Frequency Stability versus Supply Voltage

Carrier Frequency (MHz)	Lowest Frequency (MHz)	Highest Frequency (MHz)	Frequency Change (%)
13.5601	13.5599	13.5602	+/- 0.0015 %

Carrier Frequency Stability versus Temperature

Carrier Frequency (MHz)	Lowest Frequency (MHz)	Highest Frequency (MHz)	Frequency Change (%)
13.5601	13.5599	13.5602	+/- 0.0015 %

5.2 Emission Bandwidth

The EUT was placed in an anechoic chamber and the Emission Bandwidth testing was preformed in accordance with ANSI C63.4 and FCC Part 15, Paragraph 15.225. The Emission Bandwidth measurements were made to determine the intentional radiator frequency and determine the level of electromagnetic energy radiated at that frequency and at the band edges from the EUT.

5.2.1 Test Procedure

A measurement antenna (loop) was positioned at a distance of 5 meters (to insure far field measurements) from the center of the EUT. An EMI receiver was used for the emissions measurements. Initial sweep measurements were taken with the receiver in continuous frequency overview mode utilizing peak level signal detection. The intentional radiator frequency and band edge frequencies utilizing quasi-peak detection were then maximized. Maximizing a frequency involves finding the angle of the highest emission levels by rotating the EUT 360 degrees (sampling at least every 4 degrees). Then the antenna, which was fixed at 1-meter height, was rotated until the highest emissions levels found. Measurement results were automatically calculated via software running the EMI receiver. The final quasi-peak measurements recorded were determined by the following formula:

Result (dBμV/m) = receiver level (μV) + antenna factor (dB/m) + cable loss (dB) - preamp gain (dB) + lineal conversion (dB).

5.2.2 Test Criteria

The FCC Part 15 Subpart C, Paragraph 15.225 Carrier Frequency Limits are given below.

Lower Band Edge (MHz)	Upper Band Edge (MHz)
13.553	13.567

The FCC Part 15, Subpart C radiated limits are given below.

Frequency (MHz)	Distance (m)	Field Strength (dB μV/m)
1.705 to 30.00	10	48.62
13.553 to 13.567	10	99.08

Note: A 40 dB/decade extrapolation factor was use per 15.31.

5.2.3 Test Results

The EUT met the FCC Part 15, Subpart C Emission Bandwidth requirements. The intentional radiator frequency was within the allowed band and all maximized quasi-peak measurements for the EUT were below the quasi-peak limits. The test scan is shown in Appendix B.

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Passing Margin (dB)	Turntable (Degrees)	Antenna Orientation/Angle (Polarity/degrees)
13.560[1]	66.6	99.08	32.48	0	V / X+20
13.553[2]	36.9	48.62	11.72	0	V / X+20
13.567[2]	36.1	48.62	12.52	0	V / X+20

1 - Intentional Radiator Frequency

2 - Band edges measured with a receiver bandwidth setting of 1 KHz. Per ANSI C63.4 Paragraph 13.1.7.

5.3 Spurious Emissions (12.5 to 30 MHz.)

The EUT was placed in an anechoic chamber and the Spurious Emissions testing was preformed in accordance with ANSI C63.4 and FCC Part 15, Subpart C. The Spurious Emission measurements were made to determine the level of electromagnetic energy radiated from the EUT.

5.3.1 Test Procedure

A measurement antenna (loop) was positioned at a distance of 5 meters (to insure far field measurements) from the center of the EUT. An EMI receiver was used for the emissions measurements. Initial sweep measurements were taken with the receiver in continuous frequency overview mode utilizing peak level signal detection. Acceptance analysis of these sweeps was used to determine which discrete frequencies, other than the intentional radiator frequency and band edge frequencies, were to be maximized. Maximizing a frequency involves finding the angle of the highest emission levels by rotating the EUT 360 degrees (sampling at least every 4 degrees). Then the antenna, which was fixed at 1-meter height, was rotated until the highest emissions levels found. Final measurements were taken utilizing quasi-peak detection. Measurement results were automatically calculated via software running the EMI receiver. The final measurements recorded were determined by the following formula:

Result (dBµV/m) = receiver level (µV) + antenna factor (dB/m) + cable loss (dB) - preamp gain (dB) + lineal conversion (dB).

5.2.2 Test Criteria

The FCC Part 15, Subpart C radiated limits are given below.

Frequency (MHz)	Distance (m)	Field Strength (dB µV/m)
1.705 to 30.00	10	48.62
13.553 to 13.567	10	99.08

Note: A 40 dB/decade extrapolation factor was use per 15.31.

5.3.3 Test Results

The EUT met the FCC Part 15, Subpart C Spurious Emissions (12.5 to 30 MHz.) requirements. All maximized quasi-peak measurements for the EUT were below the quasi-peak limits. Test data is shown in Appendix C. The worst-case quasi-peak emission was as follows:

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Passing Margin (dB)	Turntable (degrees)	Antenna Orientation/Angle (Polarity/degrees)
13.5715	48.2	48.62	0.42	0	V / X+20

5.4 Radiated Emissions (30 to 40000 MHz)

The EUT was placed in an anechoic chamber and the Spurious Emissions testing was preformed in accordance with ANSI C63.4, FCC Part 15, Subpart B "Class A", and FCC Part 15, Subpart C. The Radiated Emission measurements were made to determine the level of electromagnetic energy radiated from the EUT.

5.4.1 Test Procedure

A measurement antenna was positioned at a distance of 3 meters from the center of the EUT. An EMI receiver was used for the emissions measurements in the range of 30 MHz to 5000 MHz (the upper limit of measurement is determined by Paragraph 15.33). Initial sweep measurements were taken with the receiver in continuous frequency overview mode utilizing peak level signal detection. Acceptance analysis of these sweeps was made to determine which discrete frequencies were to be maximized. Maximizing a frequency involves finding the angle of the highest emission levels by rotating the EUT 360 degrees (sampling at least every 4 degrees) and varying antenna height between 1 and 4 meters at the angle of highest emissions levels found. Final measurements were taken utilizing quasi-peak detection (peak and average detectors were used above 1000 MHz). Measurement results were automatically calculated via software running the EMI receiver. The final measurements recorded were determined by the following formula:

Result (dBµV/m) = receiver level (µV) + antenna factor (dB/m) + cable loss (dB) - preamp gain (dB) + lineal conversion (dB).

5.4.2 Test Criteria

The FCC Part 15, Subpart C radiated limits are given below.

Frequency (MHz)	Distance (m)	Field Strength (dB µV/m)
30 to 88	10	29.54
88 to 216	10	33.06
216 to 960	10	35.56
960 to 40000	10	43.52

The FCC Part 15, Subpart B, "Class A" radiated limits are given below. The lower limit shall apply at the transition frequency.

Frequency (MHz)	Distance (m)	Field Strength (dB µV/m)
30 to 88	10	39.08
88 to 216	10	43.52
216 to 960	10	46.44
960 to 1000	10	49.54
1000 to 40000	3	59.5 and 79.5*

* Per 15.35(B)

5.34.3 Test Results

The EUT met the FCC Part 15, Subpart C and the FCC Part 15, Subpart B, "Class A" Radiated Emissions (30 to 40000MHz.) requirements. All maximized quasi-peak measurements for the EUT were below the quasi-peak limits. Test data is shown in Appendix D. The worst-case quasi-peak emission was as follows:

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Passing Margin (dB)	Turntable (degrees)	Antenna (Meters/Polarity)
338.992	33.5	35.56[1]	2.01	105	1.5/V
799.486	33.4	46.44	13.04	140	2.15/V

Note 1: This is a harmonic of the intentional radiator, so the Subpart C limit is used.

6.0 LIST OF TEST EQUIPMENT

The following test equipment was used to perform the indicated tests. All of the test equipment was calibrated by an accredited calibration laboratory or by the manufacturer. All calibration intervals are one year. All equipment calibrations, test procedures, and the test facility are traceable to the standards of the National Institute of Standards and Technology (NIST). The test facility site attenuation verification results fall within the normalized site attenuation (NSA) criteria for open area test sites using volumetric measurements.

CONDUCTED EMISSIONS

EMCO LISN, Model 3825-2, Serial No. 1039 (cal due date: 19 June 03)
Solar High Pass Filter, Model 8131 - 5.0 (cal due date: 13 Aug 03)
HP RF Limiter, Model 11867A, Serial No. 01211 (cal due date: 13 Aug 03)
Rohde & Schwarz EMI Receiver, Model ESBI 52, S/N 835387/003 (cal due date: 02 July 03)
Rohde & Schwarz EMI Receiver Display, Serial No. 835518/001 (cal due date: 02 July 03)
Rohde & Schwarz ES-K1, ES-K2, & ES-K12 EMI Software, Version 1.60

Frequency Stability/Power Output

Advantest Spectrum Analyzer, Model R3272A, Serial No. J00233 (cal due date: 19 June 03)
Envirotronics Environmental Chamber, Model EH40-2-3-RF, Serial No. 11942753 (cal due date: 30 Nov 02)

RADIATED EMISSIONS

ElectroMetrics Loop Antenna. Model ALR25M, Serial No. 603 (cal due date: 20 June 03)
EMCO Biconilog Antenna, Model 3143, Serial No. 1111 (cal due date: 18 June 03)
Rohde & Schwarz EMI Receiver, Model ESBI 52, S/N 835387/003 (cal due date: 02 July 03)
Rohde & Schwarz EMI Receiver Display, Serial No. 835518/001 (cal due date: 02 July 03)
Rohde & Schwarz ES-K1, ES-K2, & ES-K12 EMI Software, Version 1.60

TEST FACILITY

Lindgren Semi-Anechoic Chamber, Model 11867A, serial No. 01211 (verification due date: 28 Apr 01)

The radiated and conducted emission measurements were performed in our Anechoic Chamber located at 3M Building 76, 410 Fillmore Street, St. Paul, MN. Details concerning the site are on file with the FCC laboratory Division in Columbia Maryland.

The Facility Registration Number is 93334, 31-March - 2000.

7.0 LABELING INFORMATION

The FCC (Federal Communications Commission) requires the following labeling information. Since the equipment has intentional and unintentional radiators, it must be labeled as a digital device and as an intentional radiator.

Labels on the Product

The following statement shall be placed in a conspicuous location on the device:

> This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
>
> FCC ID: _____

Labels in the Manuals

The following statement shall be placed in a prominent location in the text of the user manual:

> NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide a reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
>
> FCC ID: _____
>
> NO MODIFICATIONS. Modifications to this device shall not be made without the written consent of 3M, Incorporated. Unauthorized modifications may void the authority granted under Federal Communications Commission Rules permitting the operation of this device.

Appendix A

Conducted Emissions Test Data

CONDUCTED EMISSIONS

3
EMC Lab

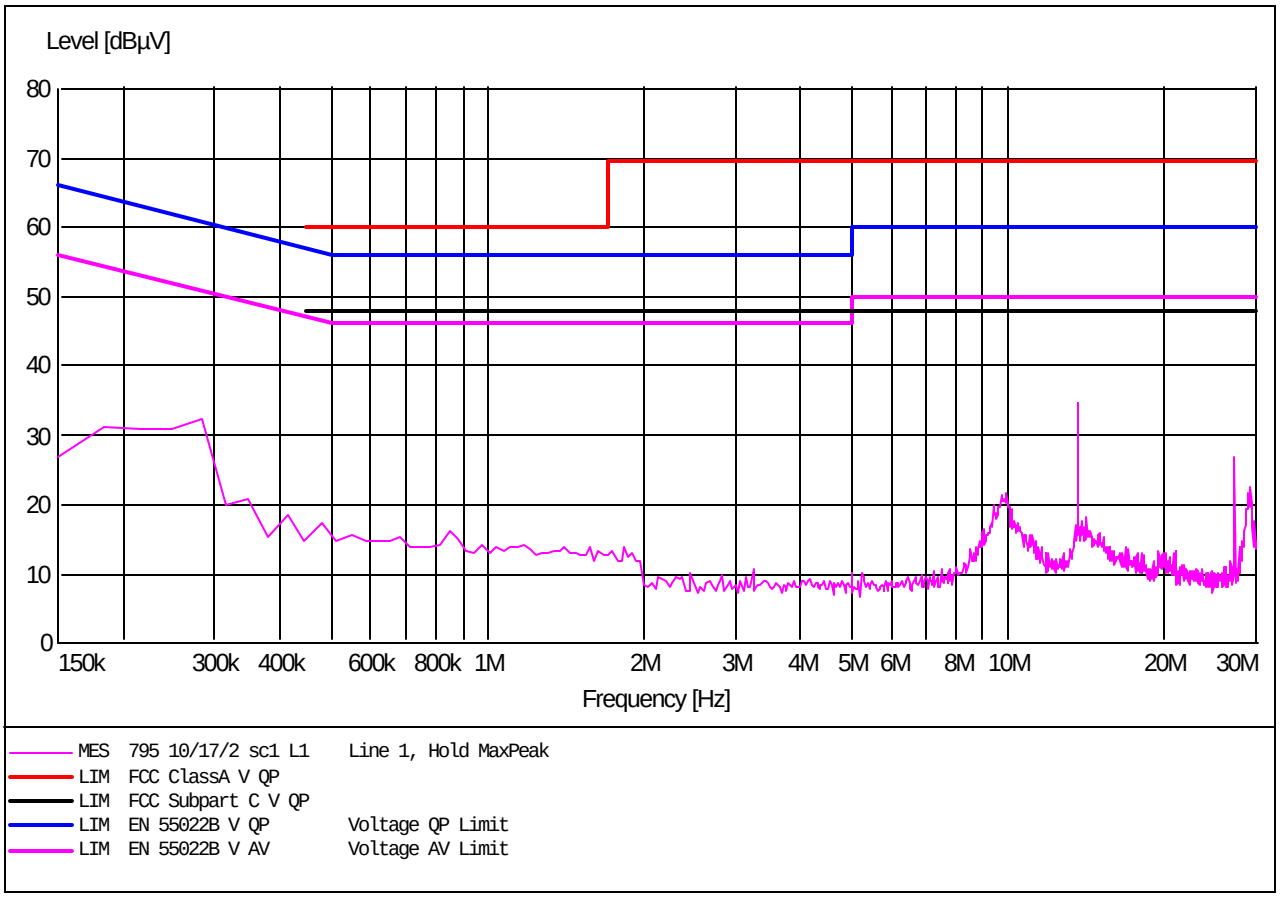
SHEET 1 OF 1

TEST REPORT # F0902001
EUT MODEL # 795 EUT SERIAL # 7950013
DESCRIPTION Digital Staff Workstation

FREQUENCY (MHz)	PEAK (dBµV)		QUASI-PEAK (dBµV)				AVERAGE (dBµV)			
	L1 Line	L2 Neutral	L1 Line	L2 Neutral	Limit	Passing Margin (dB)	L1 Line	L2 Neutral	Limit	Passing Margin (dB)
0.185	29.3	29.3	20.4	20.4						
0.282	29.3	29.2	23.7	23.3						
0.349	20.7	24.9	15.9	20.1						
1.000	14.7	14.9	8.6	8.5	48.0	39.4				
9.550	21.9	26.0	13.9	13.8	48.0	34.1				
13.5602	35.8	35.3	34.1	33.6	48.0	13.9				
27.1204	28.4	28.8	26.7	27.1	48.0	20.9				
29.200	22.9	22.0	14.0	13.5	48.0	34.0				

Signatory: Bruce Jungwirth
Test Engineer: Bruce R. Jungwirth Date: 17 October 2002

Signatory: Roger Kuhn
Reviewed by: Roger D. Kuhn Date: 21 October 2002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4M
5M
6M
8M
10M
20M
30M
Frequency [Hz]
MES 795 10/17/2 sc1 L1 Line 1, Hold MaxPeak
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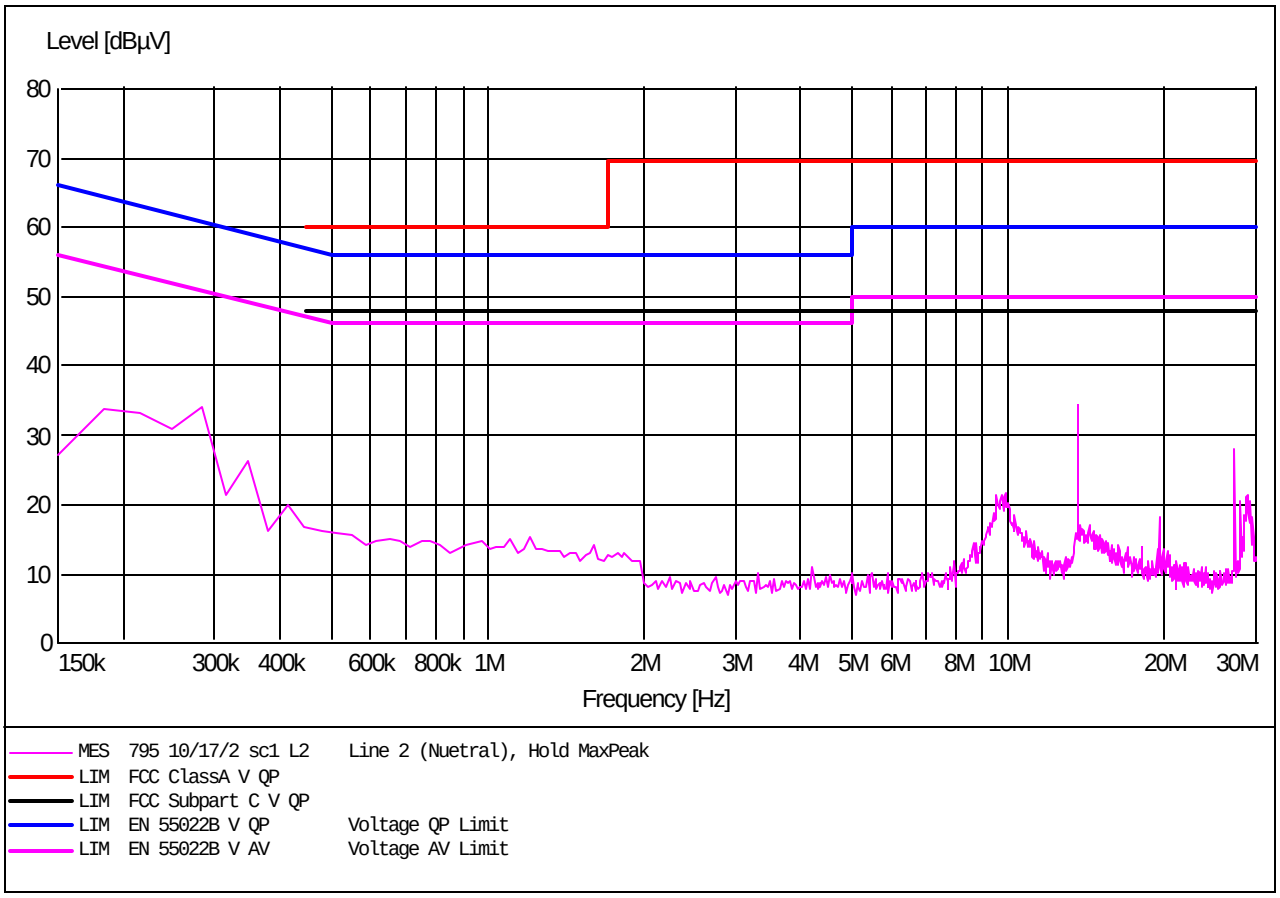
LIM FCC Subpart C V QP
LIM EN 55022B V QP Voltage QP Limit
LIM EN 55022B V AV Voltage AV Limit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1M
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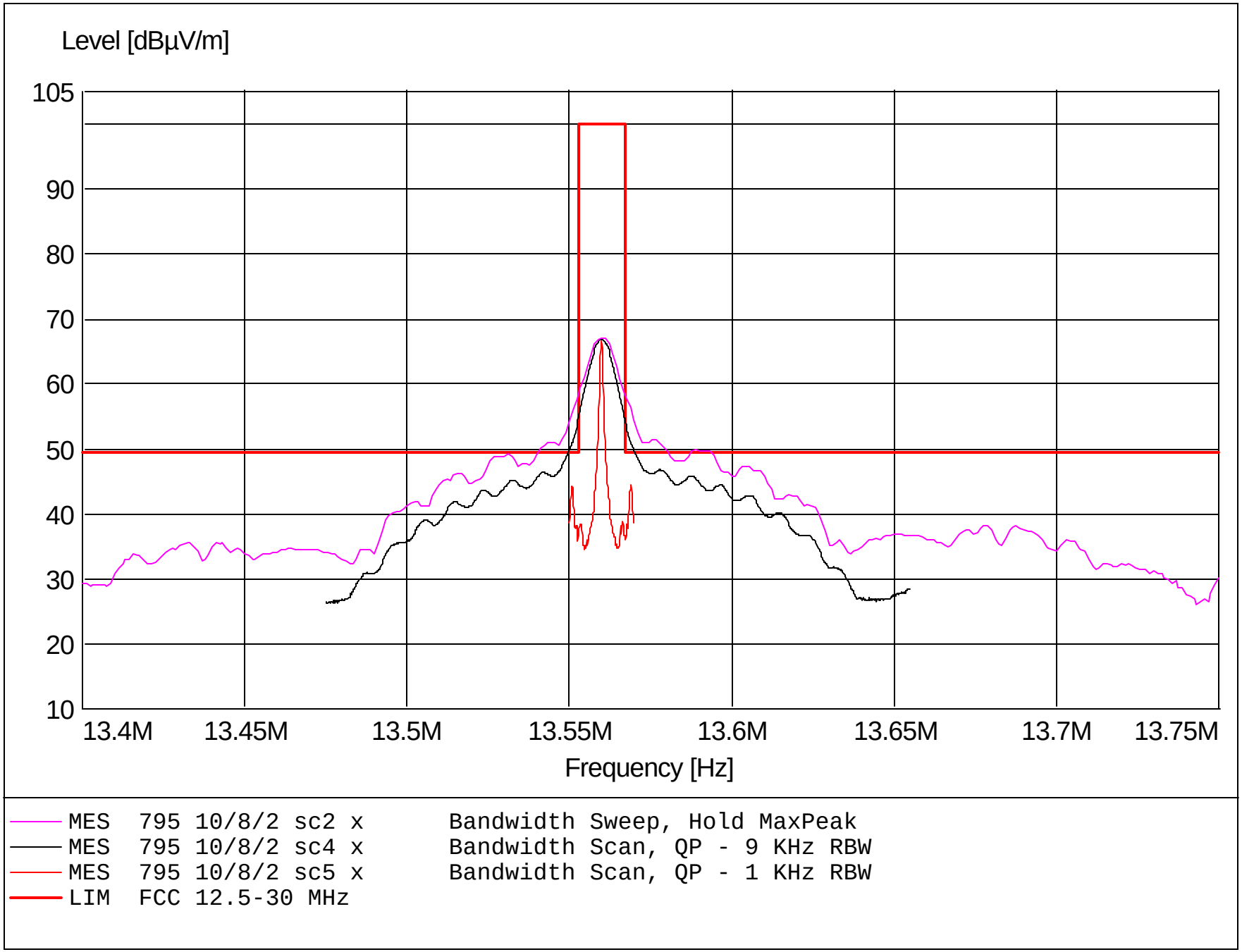
4M
5M
6M
8M
10M
20M
30M
Frequency [Hz]
MES 795 10/17/2 sc1 L2 Line 2 (Nuetral), Hold MaxPeak
LIM FCC ClassA V QP
LIM FCC Subpart C V QP
LIM EN 55022B V QP Voltage QP Limit
LIM EN 55022B V AV Voltage AV Limit

Appendix B

Emission Bandwidth


Level [dBµV/m]
105
90
80
70
60
50
40
30
20
10
13.4M
13.45M
13.5M
13.55M
13.6M
13.65M
13.7M
13.75M
Frequency [Hz]
MES 795 10/8/2 sc2 x Bandwidth Sweep, Hold MaxPeak
MES 795 10/8/2 sc4 x Bandwidth Scan, QP - 9 KHz RBW
MES 795 10/8/2 sc5 x Bandwidth Scan, QP - 1 KHz RBW
LIM FCC 12.5-30 MHz

Appendix C

Spurious Emissions

SPURIOUS EMISSIONS

3
EMC Lab

TEST REPORT # F0902001
EUT MODEL # 795 EUT SERIAL # 7950013
DESCRIPTION Digital Staff Workstation

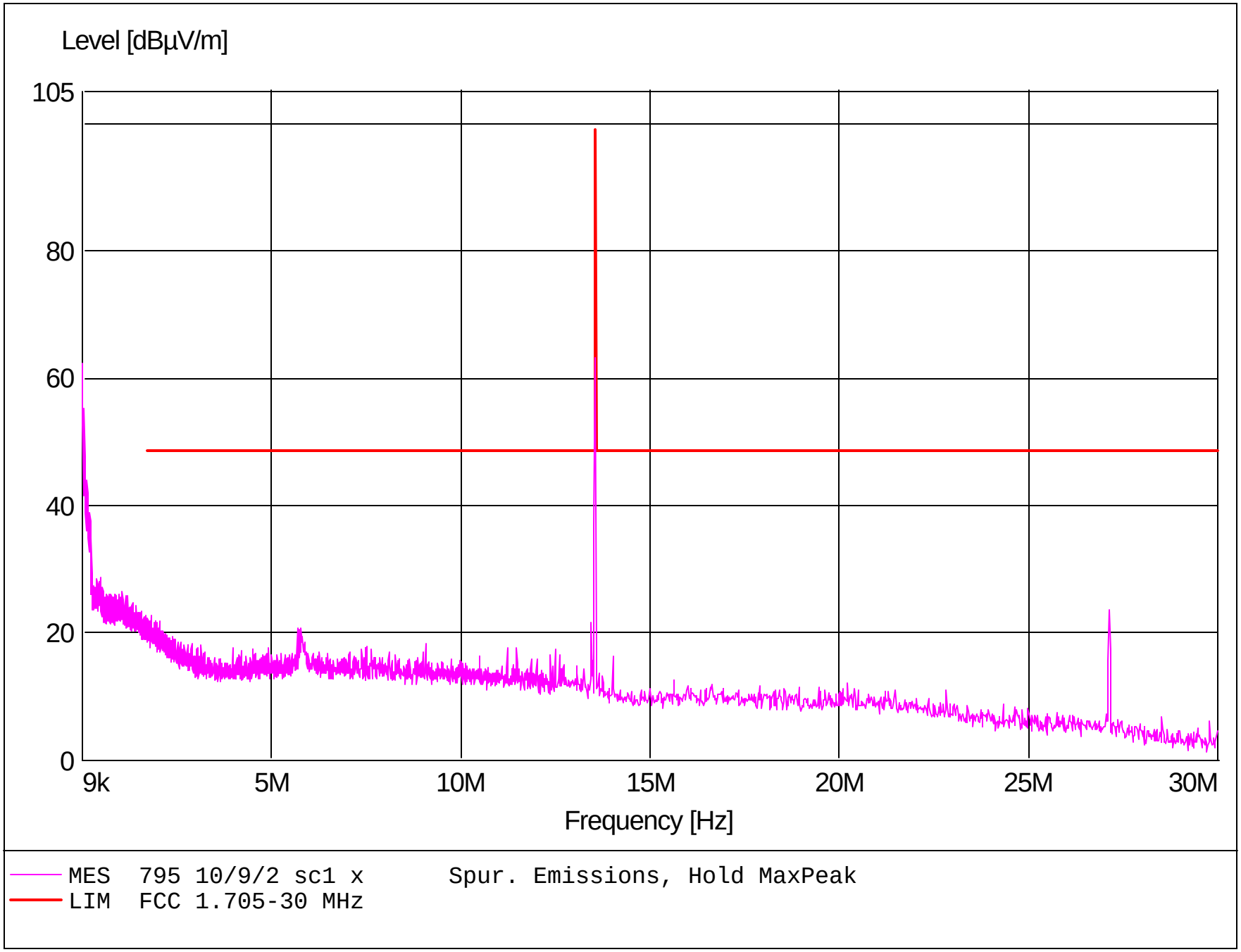
FREQ. (MHz)	MAXIMIZED QP SIGNAL H/V	MAXIMIZED QP SIGNAL (dBµV/m)*	LIMIT LINE (dBµV/m)	PASSING MARGIN (dB)	MAXIMIZED POSITION TURNTABLE (°)	MAXIMIZED POSITION ANTENNA (M)	REMARKS
Lower Antenna							
13.5485	V	48.1	48.6	0.5	0	1.0	Antenna was at +20 degrees CW from the X-axis.
13.5715	V	48.2	48.6	0.4	0	1.0	Antenna was at +20 degrees CW from the X-axis.
27.1204	V	18.3	48.6	30.3	0	1.0	Antenna was at +20 degrees CW from the X-axis.

Signatory: Bruce Jungwirth

Test Engineer: Bruce R Jungwirth Date: 9 October 2002

Signatory: Roger Kuhn

Reviewed by: Roger D. Kuhn Date: 21 October 2002


Level [dBµV/m]
105
80
60
40
20
0
9k
5M
10M
15M
20M
25M
30M
Frequency [Hz]
MES 795 10/9/2 sc1 x
Spur. Emissions, Hold MaxPeak
LIM FCC 1.705-30 MHz

Appendix D

Radiated Emissions

RADIATED EMISSIONS

3
EMC Lab

TEST REPORT # F0902001
EUT MODEL # 795 EUT SERIAL # 7950013
DESCRIPTION Digital Staff Workstation

FREQ. (MHz)	MAXIMIZED QP SIGNAL H/V	MAXIMIZED QP SIGNAL (dBµV/m)*	LIMIT LINE (dBµV/m)	PASSING MARGIN (dB)	MAXIMIZED POSITION TURNTABLE (°)	MAXIMIZED POSITION ANTENNA (M)	REMARKS
33.296	V	24.6	39.1	14.5	90	1.0	
40.668	V	26.3	29.5	3.2	0	1.0	Note 1
50.510	V	20.1	39.1	19.0	290	1.0	
67.791	V	23.2	29.5	6.3	105	1.0	Note 1
94.908	V	22.3	33.1	10.8	140	1.0	Note 1
94.961	V	23.4	43.5	20.1	0	1.0	
151.998	V	27.7	43.5	15.8	157	1.0	
170.988	H	27.8	43.5	15.7	145	1.2	
215.122	H	26.5	43.5	17.0	32	1.0	
227.984	H	26.4	46.4	20.0	25	1.0	
231.983	H	26.4	46.4	20.0	265	1.0	
338.992	V	33.5	35.6	2.1	105	1.5	Note 1
341.988	V	30.9	46.4	15.5	15	1.2	
361.000	V	27.6	46.4	18.8	0	1.2	
799.486	V	33.4	46.4	13.0	140	2.15	

Note 1: This is a harmonic of the intentional radiator, so the Subpart C limit is used.

Signatory: Bruce Jungwirth

Test Engineer: Bruce R. Jungwirth Date: 16 October 2002

Signatory: Roger Kuhn

Reviewed by: Roger D. Kuhn Date: 21 October 21, 2002

RADIATED EMISSIONS (1-5 GHz)

3
EMC Lab

SHEET 1 OF 1

TEST REPORT # F0902001

EUT MODEL # 795 EUT SERIAL # 7950013

DESCRIPTION Digital Staff Workstation

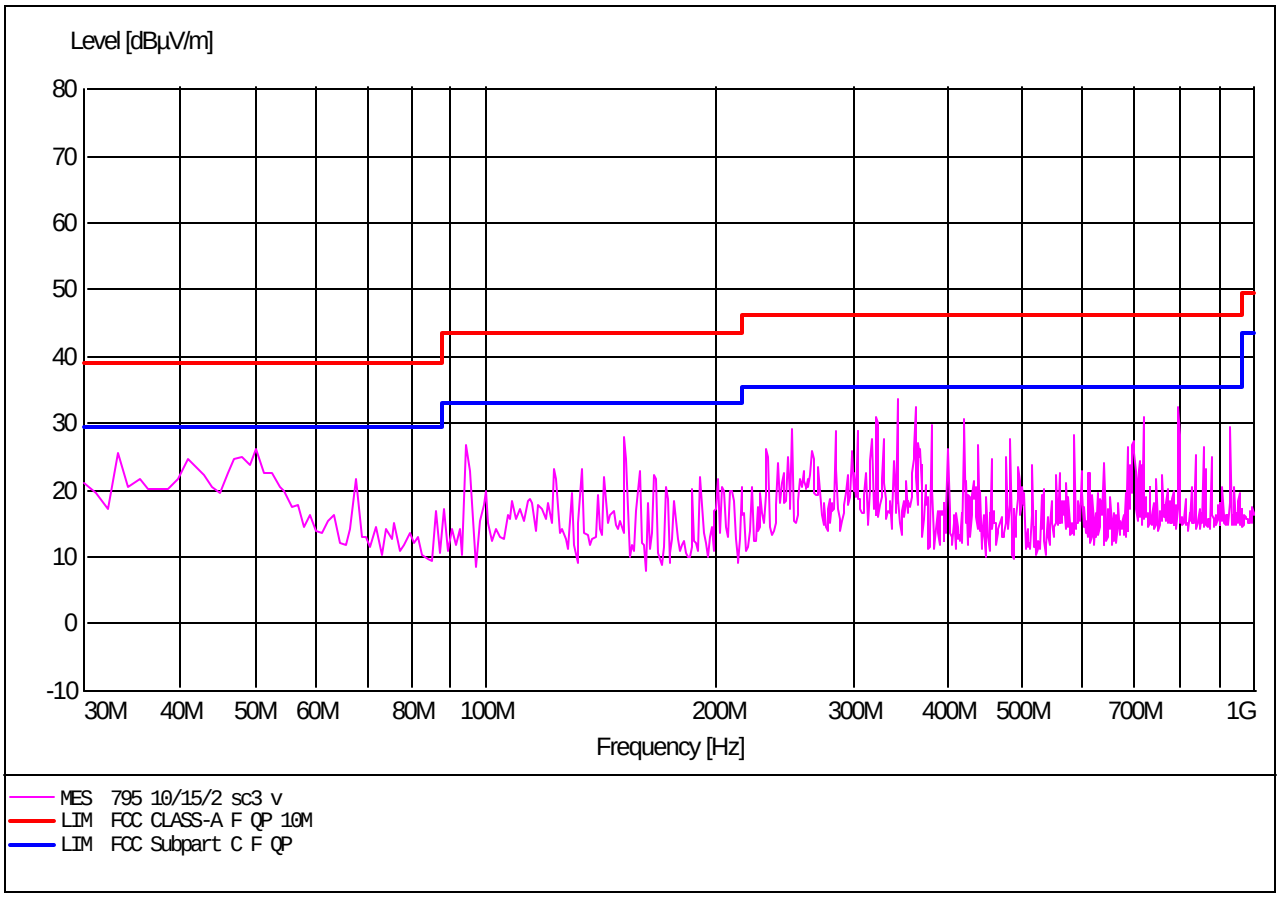
FREQ. (GHz)	AVE			PEAK			MAXIMIZED POSITION		
	MAXIMIZED SIGNAL	LIMIT LINE	PASSING MARGIN	MAXIMIZED SIGNAL	LIMIT LINE	PASSING MARGIN			
	(dBµV/m)*	(dBµV/m)	(dB)	(dBµV/m)*	(dBµV/m)	(dB)	H/V	TURNTABLE (°)	ANTENNA (M)
1.1201	32.9	59.5	26.6	42.8	79.5	36.7	H	328	1.00
1.1931	26.7	59.5	32.8	52.3	79.5	27.2	V	0	1.62
1.6801	39.1	59.5	20.4	47.3	79.5	32.2	H	88	1.09

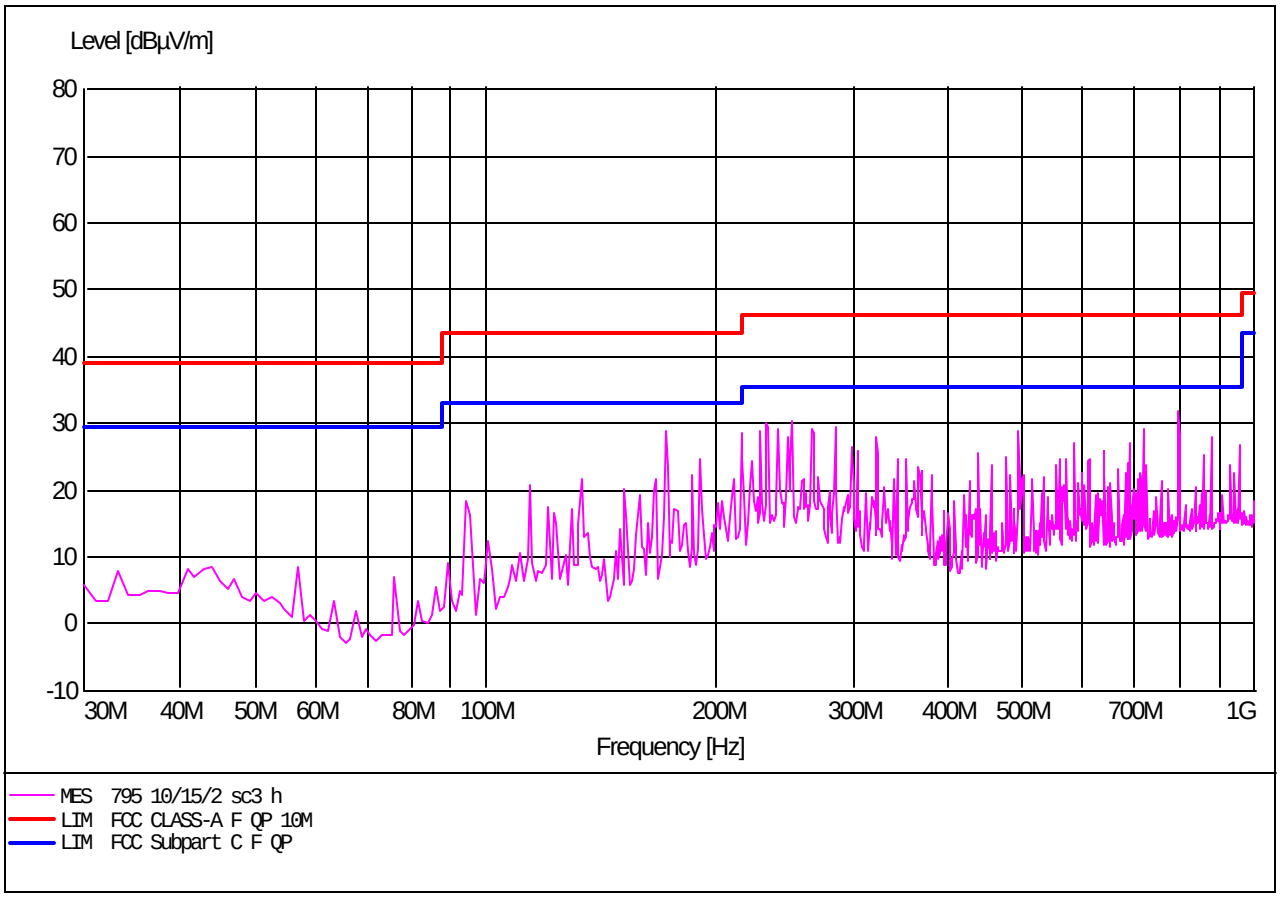
Signatory: Bruce Jungwirth

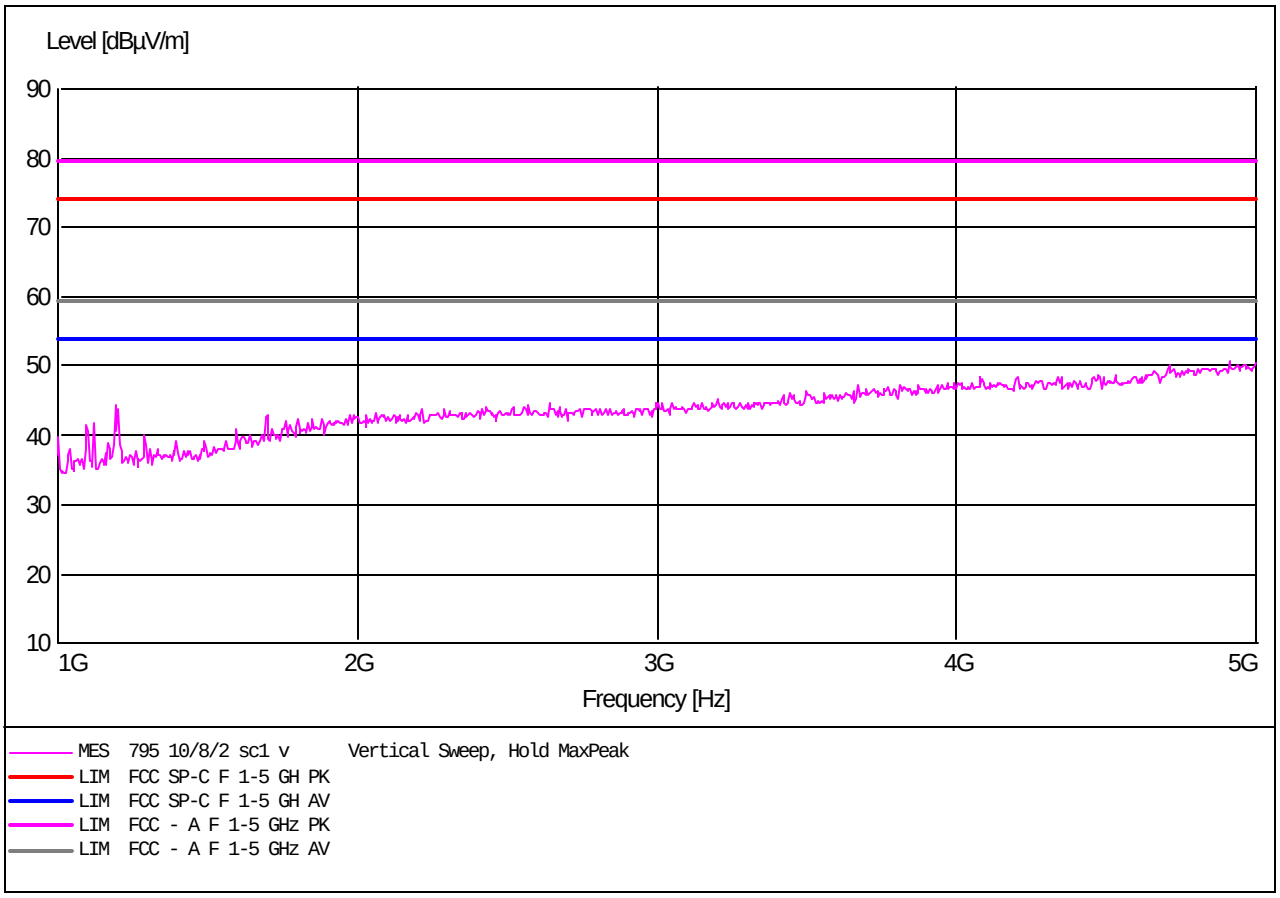
Test Engineer: Bruce R. Jungwirth Date: 8 October 2002

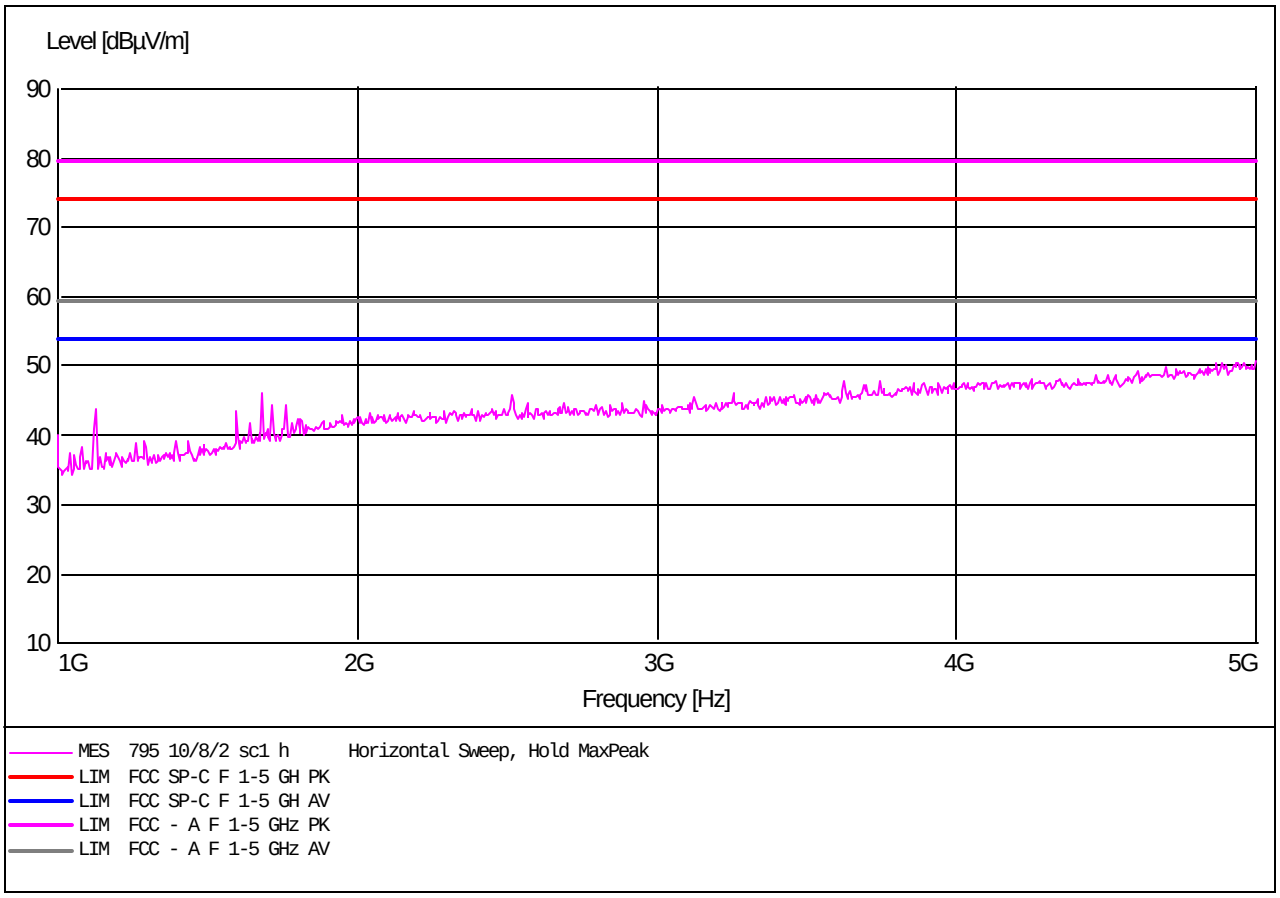
Signatory: Roger Kuhn

Reviewed by: Roger D. Kuhn Date: 21 October 2002


Level [dBµV/m]
80
70
60
50
40
30
20
10
0
-10
30M
40M
50M
60M
80M
100M
200M
300M
400M
500M
700M
1G
Frequency [Hz]
MES 795 10/15/2 sc3 v
LIM FCC CLASS-A F QP 10M
LIM FCC Subpart C F QP


Level [dBµV/m]
80
70
60
50
40
30
20
10
0
-10
30M
40M
50M
60M
80M
100M
200M
300M
400M
500M
700M
1G
Frequency [Hz]
MES 795 10/15/2 sc3 h
LIM FCC CLASS-A F QP 10M
LIM FCC Subpart C F QP

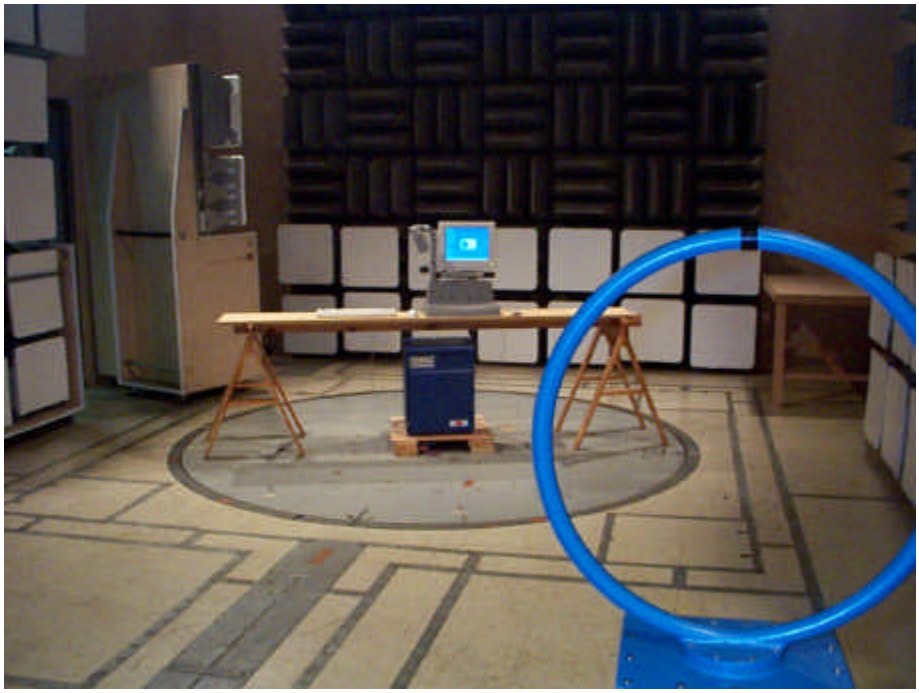

Level [dBµV/m]
90
80
70
60
50
40
30
20
10
1G
2G
3G
4G
5G
Frequency [Hz]
MES 795 10/8/2 sc1 v Vertical Sweep, Hold MaxPeak
LIM FCC SP-C F 1-5 GH PK
LIM FCC SP-C F 1-5 GH AV
LIM FCC - A F 1-5 GHz PK
LIM FCC - A F 1-5 GHz AV


Level [dBµV/m]
90
80
70
60
50
40
30
20
10
1G
2G
3G
4G
5G
Frequency [Hz]
MES 795 10/8/2 sc1 h Horizontal Sweep, Hold MaxPeak
LIM FCC SP-C F 1-5 GH PK
LIM FCC SP-C F 1-5 GH AV
LIM FCC - A F 1-5 GHz PK
LIM FCC - A F 1-5 GHz AV

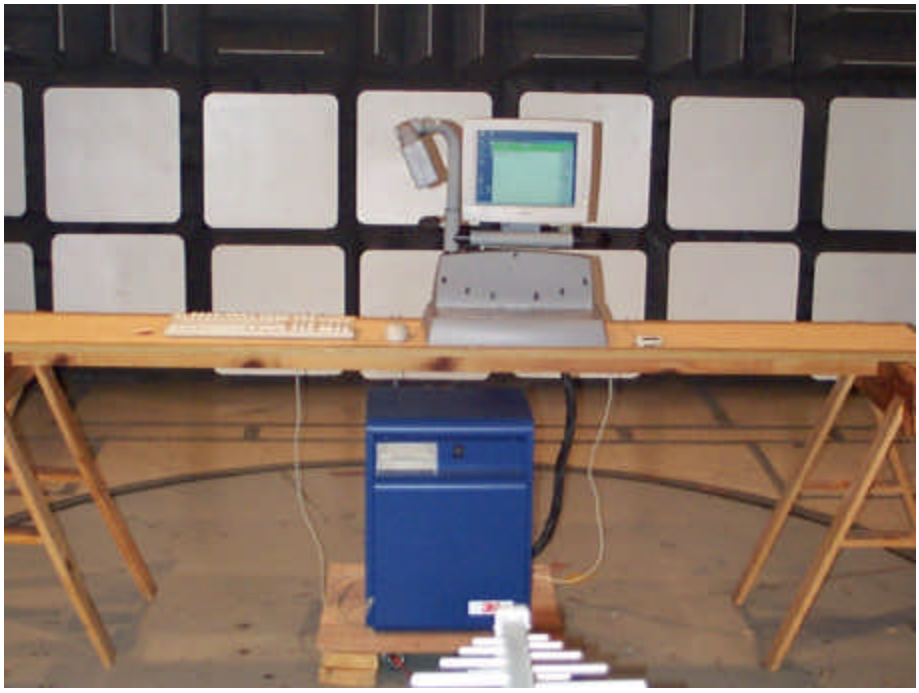
Appendix E

Photographs

Conducted Emissions



Bandwidth and Spurious Emissions



Radiated Emissions (30-1000 MHz)

Radiated Emissions (1-5 GHz)

End of Report