

MEASUREMENT/TECHNICAL REPORT

Company: Philips Medical Systems

Model: M3815A

FCC ID: PQCM3815A2

October 9, 2001

Description: This is a report to support a request for an original grant of equipment authorization.

Equipment Type: Low Power Communications Device Transmitter (DXX)

Report prepared for: Philips Medical Systems
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Introduction

This report is an application for Certification of a Transmitter operating pursuant to Part 15.249 of the FCC Rules, Code of Federal Regulations 47. The model number covered by this report is M3815A. This report is designed to demonstrate the compliance of this device with the requirements outlined in Part 15 of CFR 47 using the methods outlined in Part 2 of CFR 47.

The confidential information and descriptions included in this application are detailed descriptions of the products, block diagrams, component specifications, and schematic diagrams. We hereby respectfully request under the provision of section 0.457d of the code that the documents listed below be held confidential.

Schematics

Bill of Materials

Statement of Conformity

The Philips Medical Systems M3815A has been found to conform with the following parts of the 47 CFR as detailed below:

| Part 2 | Part 15 | Comments |
|--------|------------------|--|
| | 15.15(b) | The product contains no user accessible controls that increase transmission power above allowable levels. |
| 2.925 | 15.19 | The label is shown in the label exhibit. |
| | 15.21 | Information to the user is shown in the instruction manual exhibit. |
| | 15.27 | No special accessories are required for compliance. |
| | 15.203 | The antenna is built into the board and there is no external antenna connection. |
| | 15.205 15.209 | The fundamental is not in a Restricted band and the spurious and harmonic emissions in the Restricted bands comply with the general emission limits of 15.209. |
| | 15.207 | The unit is battery powered without the capability of being recharged or operated from the AC mains. |
| | 15.249(a) | The unit complies with the field strength limits of the 15.249(a) table including the 20dB peak restriction of 15.35(b) and 15.249(d). |
| | 15.249(c) | The unit complies with the field strength limits of the 15.209(a) table. |

Test Methodology

Radiated emission testing was performed according to the procedures in ANSI C63.4 (1992). The testing was performed at an antenna to EUT distance of 3 or 10 meters below 1 GHz, and at a distance of 3 or 1 meter(s) above 1 GHz. The actual test distance used is noted in the test data sheets. The device's performance was investigated to 10GHz. The EUT was powered by four Duracell PC1500 PROCELL 1.5Volt AA batteries. Fresh batteries were used for all testing. The circuit board was hardwired so as to produce a continuous transmission signal as opposed to the momentary transmission that occurs during regular operation. Since the device is a table-top unit, the emissions were maximized around the vertical axis and the maximum reading was recorded. The integrated antenna cannot be maximized separately.

All other performance tests were made in accordance with the procedures outlined in Part 15 of CFR 47. The applicable sections provided under Part 15 are provided in the measurement section of this report.

Test Facility

Curtis-Straus LLC

All testing for the range 30–10,000MHz was performed at Curtis-Straus (A2LA Certificate Number 1627-01). The open area test site used to collect the radiated data is located at 527 Great Road, Littleton, MA 01460. Site “T” and “F” were used.

Test Equipment Used

| SPECTRUM ANALYZERS | | | | | |
|---------------------------|-------------------------------|------------------|----------------|-------------------|------------------------|
| x | Analyzer | Model No. | Company | Serial No. | Calibration Due |
| X | YELLOW 9kHz-2.9GHz | 8594E | HP | 3523A01958 | 27-JUL-2002 |
| X | GREEN 9kHz-26.5GHz | 8593E | HP | 3829A03618 | 05-OCT-2001 |
| X | ORANGE 9kHz-26.5GHz | E4407B | HP | US39440975 | 18-MAY-2002 |

| OPEN AREA TEST SITES (OATS) | | | | | |
|------------------------------------|-----------------------|-----------------|----------------|------------------|------------------------|
| x | Site | FCC Code | IC Code | VCCI Code | Calibration Due |
| X | "F" Florida | 93448 | IC 2762-F | R-468/ C-480 | 23-JUN-2002 |
| X | "T" Texas | 93448 | IC 2762-T | R-905/ C-480 | 09-SEP-2002 |

| ANTENNAS | | | | | |
|-----------------|---|------------------|----------------|-------------------|------------------------|
| x | Antenna | Model No. | Company | Serial No. | Calibration Due |
| X | GREEN-BLACK Bilog: 30MHz-2GHz | CBL6112B | Chase | 2412 | 28-JUN-2002 |
| X | RED Bilog: 30MHz-1GHz | 3143 | EMCO | 1270 | 28-JUN-2002 |
| X | BLACK Horn: 1-18GHz | 3115 | EMCO | 9703-5148 | 12-JUN-2002 |

| PREAMPLIFIERS | | | | | |
|----------------------|--------------------------------|------------------|----------------------|-------------------|------------------------|
| x | Preamplifier | Model No. | Company | Serial No. | Calibration Due |
| X | BLACK 0.01-2000MHz | ZFL-1000-LN | MiniCircuits/ C-S | n/a | 24-MAR-2002 |
| X | ORANGE-BLACK 1-20GHz | SMC-12A | MITEQ | 690639 | 06-AUG-2002 |

Unless otherwise noted the calibration interval is one year. All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Measurement Results

Operating Frequency

This device operates at 916.5MHz.

Electric Field Strength Radiation Measurements

| Radiated Emissions Table | | | | | | | <i>Curtis-Straus LLC</i> | | |
|---|-----------------|---|--------------------|----------------------------|----------------------------------|---------------------------|-------------------------------|-------------|--------------------|
| Date: 30-Aug-01 | | Company: Philips Medical Systems | | | | Table 1 | | | |
| Engineer: Evan Gould | | EUT Desc: M3815A | | | | Work Order: B0911 | | | |
| Frequency Range: 30-2000MHz | | | | | Measurement Distance: 3 m | | | | |
| Notes: fundamental and second harmonic | | | | | EUT Max Freq: 916.5MHz | | | | |
| | | | | | Analyzer: Orange | | | | |
| Antenna Polarization (H / V) | Frequency (MHz) | Reading (dBµV) | Preamp Factor (dB) | Antenna Factor (dB/m) | Cable Factor (dB) | Adjusted Reading (dBµV/m) | FCC Class B | | |
| | | | | | | | Limit (dBµV/m) | Margin (dB) | Result (Pass/Fail) |
| 20kHz BW pk (H, 1m) | 916.59 | 86.9 | 22.0 | 21.6 | 4.1 | 90.6 | 93.97 | -3.4 | Pass |
| 1MHz BW pk (H, 1m) | 1833.2 | 37.3 | 18.4 | 26.6 | 6.5 | 52.0 | 53.9 | -1.9 | Pass |
| Table Result: Pass | | | by | | -1.9 dB | | Worst Freq: 1833.2 MHz | | |
| Test Site: "T" | | Pre-Amp: Black | | Cable: 65 ft RG8A/U | | | Antenna: Grn-Blk | | |

| Radiated Emissions Table | | | | | | | <i>Curtis-Straus LLC</i> | | |
|---|-----------------|---|--------------------|----------------------------|----------------------------------|---------------------------|-------------------------------|-------------|--------------------|
| Date: 30-Aug-01 | | Company: Philips Medical Systems | | | | Table 2 | | | |
| Engineer: Evan Gould | | EUT Desc: M3815A | | | | Work Order: B0911 | | | |
| Frequency Range: 2-10GHz | | | | | Measurement Distance: 1 m | | | | |
| Notes: third through tenth harmonics | | | | | EUT Max Freq: 916.5MHz | | | | |
| | | | | | Analyzer: Orange | | | | |
| Antenna Polarization (H / V) | Frequency (MHz) | Reading (dBµV) | Preamp Factor (dB) | Antenna Factor (dB/m) | Cable Factor (dB) | Adjusted Reading (dBµV/m) | FCC Class B | | |
| | | | | | | | Limit (dBµV/m) | Margin (dB) | Result (Pass/Fail) |
| H 1MHz BW pk | 2749.8 | 32.6 | 24.4 | 31.1 | 2.5 | 41.8 | 63.5 | -21.7 | Pass |
| H 1MHz BW pk | 3664.4 | 30.4 | 24.2 | 33.3 | 3.3 | 42.8 | 63.5 | -20.7 | Pass |
| H 1MHz BW pk | 4583.1 | 30.6 | 24.3 | 34.1 | 3.7 | 44.1 | 63.5 | -19.4 | Pass |
| H 1MHz BW pk | 5499.7 | 33.0 | 24.0 | 36.4 | 3.8 | 49.2 | 63.5 | -14.3 | Pass |
| H 1MHz BW av | 6416.3 | 19.2 | 23.1 | 36.5 | 3.9 | 36.5 | 63.5 | -27.0 | Pass |
| H 1MHz BW av | 7332.9 | 19.6 | 22.2 | 37.8 | 4.0 | 39.2 | 63.5 | -24.3 | Pass |
| H 1MHz BW av | 8249.5 | 18.7 | 21.2 | 38.0 | 4.1 | 39.6 | 63.5 | -23.9 | Pass |
| H 1MHz BW av | 9166.1 | 18.9 | 20.6 | 39.9 | 4.3 | 42.5 | 63.5 | -21.0 | Pass |
| Table Result: Pass | | | by | | -14.3 dB | | Worst Freq: 5499.7 MHz | | |
| Test Site: "T" | | Pre-Amp: Or-Blk | | Cable: 3m Microflex | | | Antenna: Black Horn | | |

| Radiated Emissions Table | | | | | | | Curtis-Straus LLC | | |
|--|-----------------|---|--------------------|-----------------------|---|---------------------------|--------------------------|-------------|--------------------|
| Date: 30-Aug-01 | | Company: Philips Medical Systems | | | | Table 3 | | | |
| Engineer: Evan Gould | | EUT Desc: M3815A | | | | Work Order: B0911 | | | |
| Frequency Range: 30-10000MHz | | | | | Measurement Distance: 3 m (10m for 133.4MHz) | | | | |
| Notes: spurious emissions | | | | | EUT Max Freq: 916.5MHz | | | | |
| | | | | | Analyzer: Green, Yellow | | | | |
| Antenna Polarization (H / V) | Frequency (MHz) | Reading (dBµV) | Preamp Factor (dB) | Antenna Factor (dB/m) | Cable Factor (dB) | Adjusted Reading (dBµV/m) | FCC Class B | | |
| | | | | | | | Limit (dBµV/m) | Margin (dB) | Result (Pass/Fail) |
| noise floor | 133.4 | 20.8 | 22.3 | 12.3 | 1.1 | 11.9 | 43.5 | -31.6 | Pass |
| H | 367.4 | 31.1 | 22.3 | 15.6 | 2.2 | 26.6 | 46.0 | -19.4 | Pass |
| H | 717.4 | 24.3 | 22.2 | 20.2 | 3.6 | 25.9 | 46.0 | -20.1 | Pass |
| H | 812.1 | 25.9 | 22.1 | 20.9 | 3.9 | 28.6 | 46.0 | -17.4 | Pass |
| H | 817.1 | 27.5 | 22.1 | 21.0 | 3.9 | 30.3 | 46.0 | -15.7 | Pass |
| H | 1699.9 | 34.0 | 20.1 | 25.8 | 6.3 | 46.0 | 54.0 | -8.0 | Pass |
| Table Result: Pass by -8.0 dB Worst Freq: 1699.9 MHz | | | | | | | | | |
| Test Site: "T", "F" Pre-Amp: Black, Orange-Blk Cable: 65 ft RG8A/U, Microflex Antenna: Grn-Blk, Black, Red | | | | | | | | | |

NOTE: There were no emissions from the product detected from 2-10GHz.

Emissions Plots

Fundamental

Agilent 11:14:46 Aug 30, 2001

