

TEST REPORT PREPARED BY:

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**Report for Emissions: FCC Part 15 subpart C, Testing of the
TelePATH Millenium System**

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Prepared for:

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1.0 INTRODUCTION

1.1 SCOPE

The purpose of this report is to present the findings and results of compliance testing performed, against FCC Part 15 Subpart C.

1.2 APPLICANT

This test report has been prepared for Critical Control Corporation.

1.3 APPLICABILITY

All test procedures, limits, and results defined in this document apply to the Critical Control Corporation TelePATH Millenium System unit, referred to herein as the Equipment Under Test (EUT).

The results contained in this report relate only to the item(s) tested.

This report does not imply product endorsement by NVLAP or the Canadian or US governments.

1.4 TEST SAMPLE DESCRIPTION

The test sample, provided for testing was a TelePATH Millenium System.

Product Type: Wireless telephone link

Model Number: TM2000

Cables: 1 DC power lead, 1 RJ11 phone plug, 1 RF cable

Power Requirements: -48 VDC

Peripheral Equipment: NorTel MilleniumTelephone, RJ11 feed to Central Office Equipment, one of several factory-supplied antennas.

1.5 GENERAL TEST CONDITIONS AND ASSUMPTIONS

The EUT was setup and exercised using the configurations, modes of operation and arrangements defined in this report only. All inputs and outputs to and from other equipment associated with the EUT were adequately simulated.

Where relevant, the EUT was only tested using the monitoring methods and test criteria defined in this report.

All testing, unless otherwise noted, was performed under the following environmental conditions:

Temperature: 17 to 23 °C

Humidity: 45 to 75 %

Barometric Pressure: 68 to 106 kPa

1.6 SCOPE OF TESTING

Tests were performed in accordance with FCC Part 15 Subpart C (1996).

1.6.1 VARIATIONS IN TEST METHODS

The following variations in test methodology were noted during testing:

The yagi antenna was used for measurement of Radiated Emissions, as being the worst-case configuration. The levels produced by other optional configurations are assumed to be lower.

No AC Conducted Emissions testing was performed. The EUT is powered by -48 VDC. There is no connection to the AC mains, and no DC supply is provided by the EUT manufacturer.

Initial spectral power density measurements were taken at the antenna connector of the manufacturer-supplied cable, with the peak hold function of the spectrum analyzer. The observed peak levels were far below the specified limit, so no further investigation was made to determine the average value for this characteristic. The highest reading obtained is less than the limit by a margin greater than the gain of the available antennas.

1.6.2 TEST SAMPLE MODIFICATIONS

There were no equipment modifications during test performance.

2. ABBREVIATIONS

| | | | |
|------------|-------------------------|------------|---------------------|
| CE | -Conducted Emissions | N/A | -Not Applicable |
| E | -Field - Electric Field | RE | -Radiated Emissions |
| N/T | -Not Tested | | |

3.0 MEASUREMENT UNCERTAINTY

The following measurement uncertainty with 95% confidence level was calculated using the methods defined in NAMAS document NIS81: May 1994.

- For Radiated E-Field Emissions
 - Frequency = $\pm 1 \times 10^{-3}$ MHz
 - Amplitude = ± 4.01 dB
- For Conducted Emissions
 - Frequency = $\pm 1 \times 10^{-3}$ MHz
 - Amplitude = ± 3.25 dB

4.0 TEST CONCLUSION

The EUT was subjected to the following tests. Compliance status is designated as **PASS** or **FAIL**. The table summarizes the test results in terms of the specification and class or level applied, the test sample identification, and the EUT modification state.

| TEST CASE | TEST TYPE | PART | TEST SAMPLE | MOD. STATE | CONFIGURATION | RESULT |
|-----------|---|---------------------------------|---------------------------|------------|--|-------------|
| 4.1 | Radiated Emissions | 15.247c, 15.249c, 15.209a | TelePATH Millenium System | preprod | Simulated Installation | PASS |
| 4.2 | Radiated Emissions, Occupied Bandwidth | 15.247a (2) | TelePATH Millenium System | preprod | Simulated Installation | PASS |
| 4.3 | Radiated Emissions, Duty Cycle | 15.247e | TelePATH Millenium System | preprod | Simulated Installation | PASS |
| 4.4 | Conducted Emissions, Output Power | 15.247b | TelePATH Millenium System | preprod | Direct connection to spectrum analyzer | PASS |
| 4.5 | Conducted Emissions, Spectral Power Density | 15.247d | TelePATH Millenium System | preprod | Direct connection to spectrum analyzer | PASS |

STATEMENT OF COMPLIANCE

The client equipment referred to in this report was found to comply with the requirements as stated above.

5.0 TEST FACILITY

5.1 LOCATION

The EUT was tested for Electromagnetic Compatibility at the Electronics Test Centre, located in Airdrie, Alberta, Canada.

5.2 GROUNDING PLAN

The EUT was located on a wooden table 80 cm above the ground. The EUT was grounded according to Critical Control Corp. specifications.

5.3 POWER

DC power was supplied via a CORCOM RFI feed through, 60 Ampere, wall mounted filter. Bonding to hydro ground is via one inch grounding braid straps.

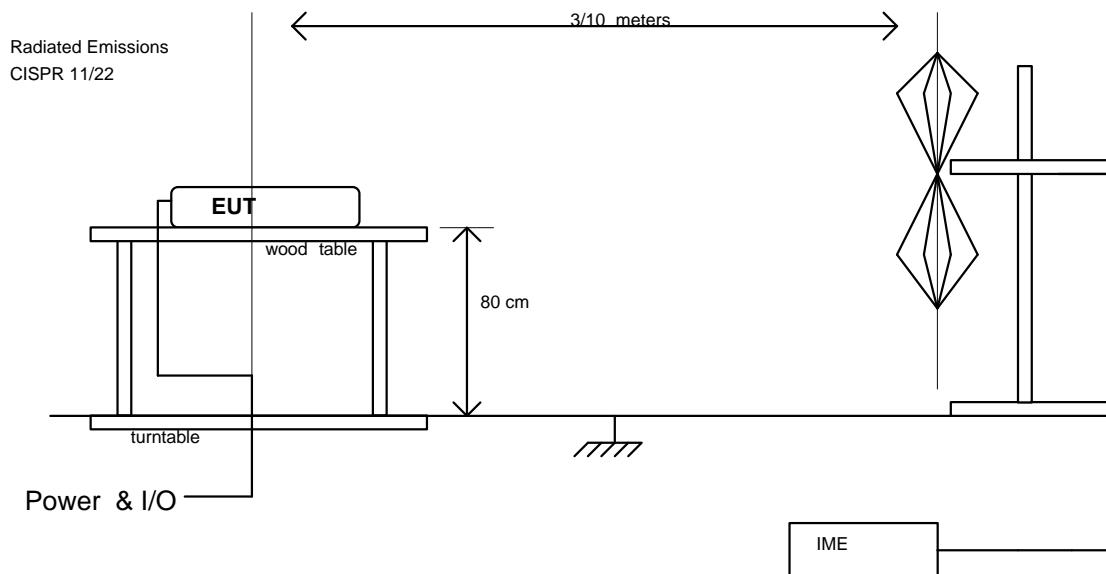
5.4 EMISSIONS PROFILE

Ambient radiated electromagnetic emission profiles were generated during the tests and are included in the report data.

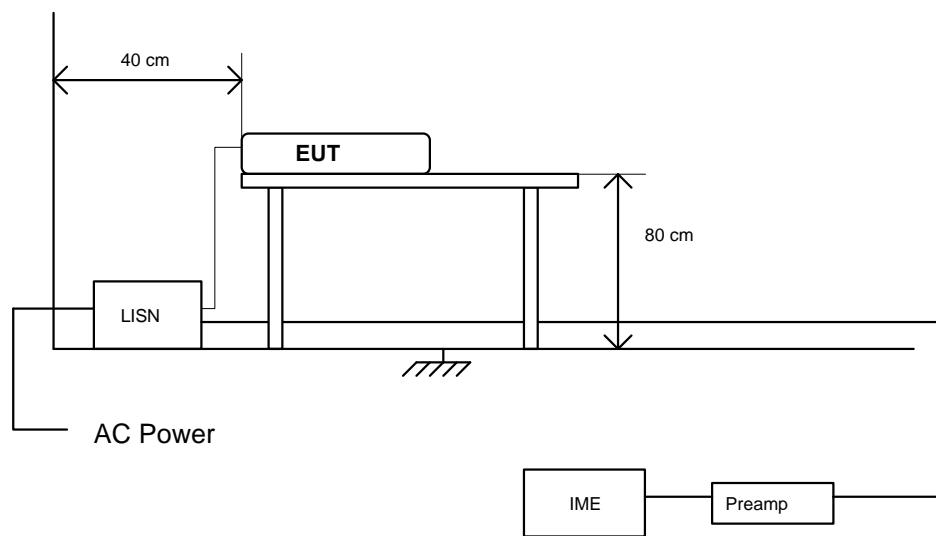
5.5 TEST CONFIGURATION

5.5.1 Table Top Equipment

The following diagrams illustrate the configuration of the EUT test and measurement equipment used for FCC and CISPR Radiated and Conducted Emissions Testing.



Conducted Emissions CISPR 11 / 22



6.0 TEST EQUIPMENT

The following equipment was utilized for this procedure. All measurement devices are calibrated annually, traceable to NIST.

6.1 RADIATED EMISSIONS

- a) Spectrum Analyzer w/ preselecter
- b) CISPR Quasi-peak Adapter
- c) Power Isolation Transformers
- d) Biconilog antenna (25 MHz to 2 GHz)
- e) DRG horn antenna
- f) Antenna mast positioner, and controller
- g) Flush-mounted turntable, and controller
- h) Personal Computer and EMI/EMC Software

6.2 CONDUCTED EMISSIONS

- a) Spectrum Analyzer w/ preselecter
- b) Power Isolation Transformer
- c) FCC specified LISN
- c) Personal Computer and EMI/EMC Software

6.3 SPECTRUM ANALYZER SETTINGS

6.3.1 Spectrum Analyzer Range 1 of 3

| | |
|----------------------|-------------------|
| Start Frequency | 0.15 MHz |
| Stop Frequency | 30 MHz |
| Transducer | LISN per CISPR 16 |
| Quasi-Peak Bandwidth | 9 kHz |
| Spectrum Analyzer BW | 10 kHz |
| Video Bandwidth | 100 kHz |
| Reference Level | 100 dB μ V |

Spectrum Analyzer Range 2 of 3

| | |
|----------------------|-------------------|
| Start Frequency | 30 MHz |
| Stop Frequency | 2,000 MHz |
| Transducer | Biconilog Antenna |
| Quasi-Peak Bandwidth | 120 kHz |
| Spectrum Analyzer BW | 120 kHz |
| Video Bandwidth | 1 MHz |
| Reference Level | 100 dB μ V |

Spectrum Analyzer Range 3 of 3

| | |
|----------------------|----------------|
| Start Frequency | 2,000 MHz |
| Stop Frequency | 10,000 MHz |
| Transducer | DRG Horn |
| Spectrum Analyzer BW | 1 MHz |
| Video Bandwidth | 10 MHz |
| Reference Level | 100 dB μ V |