March 18, 2005

LEXMARK INTERNATIONAL

TEST REPORT

FCC Part 15

INDUSTRY CANADA RSS - 210

TRADE NAME: Lexmark C920 / C920n Printer

TYPE/MODEL NUMBER: Type/Model: 5056-000, -010, and -030

TECHNICAL REPORT

TECHNICAL REPORT

NAME OF MANUFACTURER

Lexmark International, Inc.
740 New Circle Rd.
Lexington, Kentucky 40511

TRADE NAME: Lexmark C920 / C920nPrinter

TYPE/MODEL NUMBER: Type/Model: 5056-000, -010, and -030

FCC I.D.: IYL5056

INDUSTRY CANADA I.D.: 2376A - 5056

PRINTER POWER RATING:

Input: 120-127 vac 50/60 Hz.

TESTING PROCEDURE:

Testing Performed Per ANSI C63.4 (2003), Industry Canada RSS-210

OFFICIAL SIGNATORY: Keith Hardin (Lexmark) The signature on Page 4 of this report indicate that this entire report and the data contained herein have been reviewed by the signatory. No additional signatures are required on any test data sheets contained in this report.

OPERATING INSTRUCTIONS

See User's Guide provided separately

SUMMARY

The test results in this report represent the emissions from the intentional radiator portion of the C920/C920n printer. The emissions from the unintentional radiator portion, limits that are found in FCC Part 15, Subpart B and ICES-003, are found in a corresponding test report.

These results indicate that this product complies with the emission limits found in the FCC Part 15 Rules, Section 15.207 for conducted emissions and Section 15.209 for radiated emissions. In addition, these results indicate that the product complies with the emission limits of Industry Canada RSS-210, Issue 5, Section 6.2.1.

This report has been reviewed by:

Keith Hardin	Keith Hardin	3-18-05
Name	Signature	Date

PRODUCT INFORMATION

EMC SUPPRESSION COMPONENTS and CLOCK FREQUENCIES

Suppression Components (Intentional Radiator):

None

Clock Frequencies (Intentional Radiator):

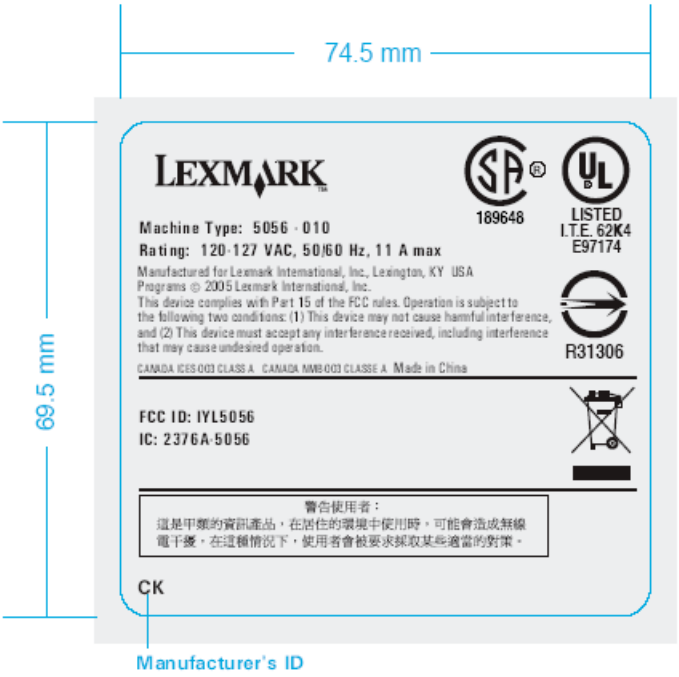
13.56 MHz.

CABLE INFORMATION

CABLE DESCRIPTION	LENGTH	SHIELDING STATUS
1. Molex USB serial cable (Lexmark pt. no. 43H5856)	2.0 meters	Shielded
2. Printer cable, Parallel (Lexmark pt. no. 1329605)	3.0 meters	Shielded
3. HP MX50 Display	2.0 meters	Shielded
4. DELL Keyboard	2.0 meters	Shielded
5. Microsoft X05 mouse	2.0 meters	Shielded
6. Peripheral Power Line Cords	2.0 meters	Unshielded
7. EUT line cords	8.0 feet	Unshielded
8. Speaker cords	2.0 meters	Shielded

Please note, the above cables were used during the radiated and conducted interference measurements.

PRODUCT LABEL



EMC MEASUREMENTS and DATA

LEXMARK CONFIDENTIAL UNTIL ANNOUNCED BY LEXMARK

TESTING & MEASUREMENT EQUIPMENT – RADIATED & CONDUCTED

TRADE NAME: Lexmark C920 / C920n Printer

TYPE/MODEL NUMBER: Type/Model: 5056-000, -010, and -030

FCC I.D.: IYL5056

PC HOST AND PERIPHERALS:
DELL (S/N 3CMBX11) MOD. DHS
w/ DELL KEYBOARD (MOD. SK1000REW)
HP MX50 DISPLAY (MOD. P1282A) s/n THTCU38682
w/MICROSOFT X05 INTELLIMOUSE s/n 52195-576-1455956-00000
MICROSOFT SIDEWINDER JOY PAD pt. no. X03-57019
s/n 85587578129800110000 (game port device)
TRACKBALL s/n 21023573 (serial device)
POLK AUDIO SPEAKERS

TEST INSTRUMENTATION: RADIATED INTERFERENCE: 30…..1,000 MHZ

EQUIPMENT	MODEL	CAL. DATE	CAL. INTERVAL
ROHDE & SCHWARZ EMI EMI REC./S.A. S/N 100092	ESIB7	5/04	1 YR.
ROHDE & SCHWARZ EMI EMI REC./S.A. S/N 100148	ESIB40	5/04	1 YR.
SCHAFFNER-CHASE BI-LOG ANTENNA (30 MHz – 1 GHz) S/N 2460	CBL6111C	6/03	2 YR.
ANTENNA RESEARCH ASSOC. HORN ANTENNA (1 – 18 GHZ)	DRG-1181A	N/A	N/A
ROHDE & SCHWARZ LOOP ANTENNA (9kHz – 30 MHz	HFH – 2Z2	10/04	1 YR.

TEST INSTRUMENTATION: CONDUCTED INTERFERENCE: 0.150 - 30 MHZ

EQUIPMENT	MODEL	CAL. DATE	CAL. INTERVAL
ROHDE & SCHWARZ EMI EMI REC./S.A. S/N 100009	ESIB7	5/04	1 YR.
RHODE & SCHWARZ ESH2-Z5, ARTIFICIAL-MAINS NETWORK S/N 848765/017	338.5219.53 9..150 KHZ (30 MHZ)	5/04	1 YR.
DELL OPTIPLEX COMPUTER S/N UT3J7	GX1P	N/A	

MAXIMUM PEAK OUTPUT POWER

DATA ON 110v Lexmark C920 Printer, Type/Model: 5056-000

Freq. (MHz)	Level dB(μV/m) (Q-P)	FCC Limit @ 10m	Margin dB
13.56	31.68	48.6	16.9
Maximum variation over 85% - 115% of AC input voltage			±0.1 dB

(Temperature of Radiated test environment / facility at time of testing = **73 deg. F**)

PROCEDURE: TESTING PERFORMED PER ANSI C63.4 (2003), RSS - 210

FCC Part 15 limit is specified as 29.5 dBuV/m at a 30 meter distance. Limit at 10 meters is determined by the following technique: 10m limit = 30m limit + 20* log 10 (30 / 10) **2

Date / Place of Testing: February 2005 Lexmark International Inc.
740 New Circle Rd.
Lexington, Ky. 40511
Report Produced and Compiled By: Stephen G. Parker (Lexmark)
Official Signatory: Keith Hardin (Lexmark)
Radiated EMI Testing performed By: John Fessler (Lexmark)

John T. Fessler

SPURIOUS EMISSIONS < 30 MHz.

DATA ON 110v Lexmark C920 Printer, Type/Model: 5056-000

Freq. (MHz)	Level dB(µV/m) (Q-P)	FCC Limit @ 10m	Margin dB
27.12	25.06	48.6	23.5

(Temperature of Radiated test environment / facility at time of testing = **73 deg. F**)

PROCEDURE: TESTING PERFORMED PER ANSI C63.4 (2003), RSS - 210

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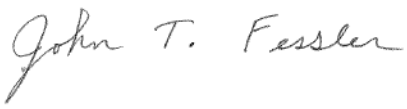

SPURIOUS EMISSIONS > 30 MHz.

DATA ON 110v Lexmark C920 Printer, Type/Model: 5056-000
MODE: Printing Parallel @ 32ppm

Freq. (MHz)	Antenna Polarity	Cable Loss dB	Antenna Factor dB/m	Receiver Level dB(μV) (Q-P)	Total dB(μV/m)	FCC Part 15 3m Limit dB(μV/m)	Margin dB
40.68	V3	6.92	14.34	13.25	34.51	40	5.49
162.72	V3	7.83	11.04	18.13	37.00	43.5	6.50
122.04	V3	7.73	12.18	16.98	36.89	43.5	6.61
149.16	V3	7.90	11.85	16.09	35.84	43.5	7.66
94.92	V3	7.45	10.11	16.17	33.73	43.5	9.77
216.96	V3	8.23	10.34	16.88	35.45	46	10.55
189.84	H3	8.02	9.44	21.80	39.26	43.5	4.24

(Temperature of Radiated test environment / facility at time of testing = **73 deg. F**)

NOTE: A search was made of the frequency spectrum from 30 MHz to 2000 MHz with the antennas located at a distance of 3 meters from the EUT. Cables were oriented for maximum radiation via experimentation during measurement. The measurement results indicate that all frequencies associated with the intentional radiator portion of the EUT are below the **FCC Part 15** limits. Only the worst case interference is listed.

PROCEDURE: TESTING PERFORMED PER C63.4 (2003), RSS - 210

Total dB(uV/m) = Cable loss + Antenna factor + Receiver level.
Margin dB = Limit – Total

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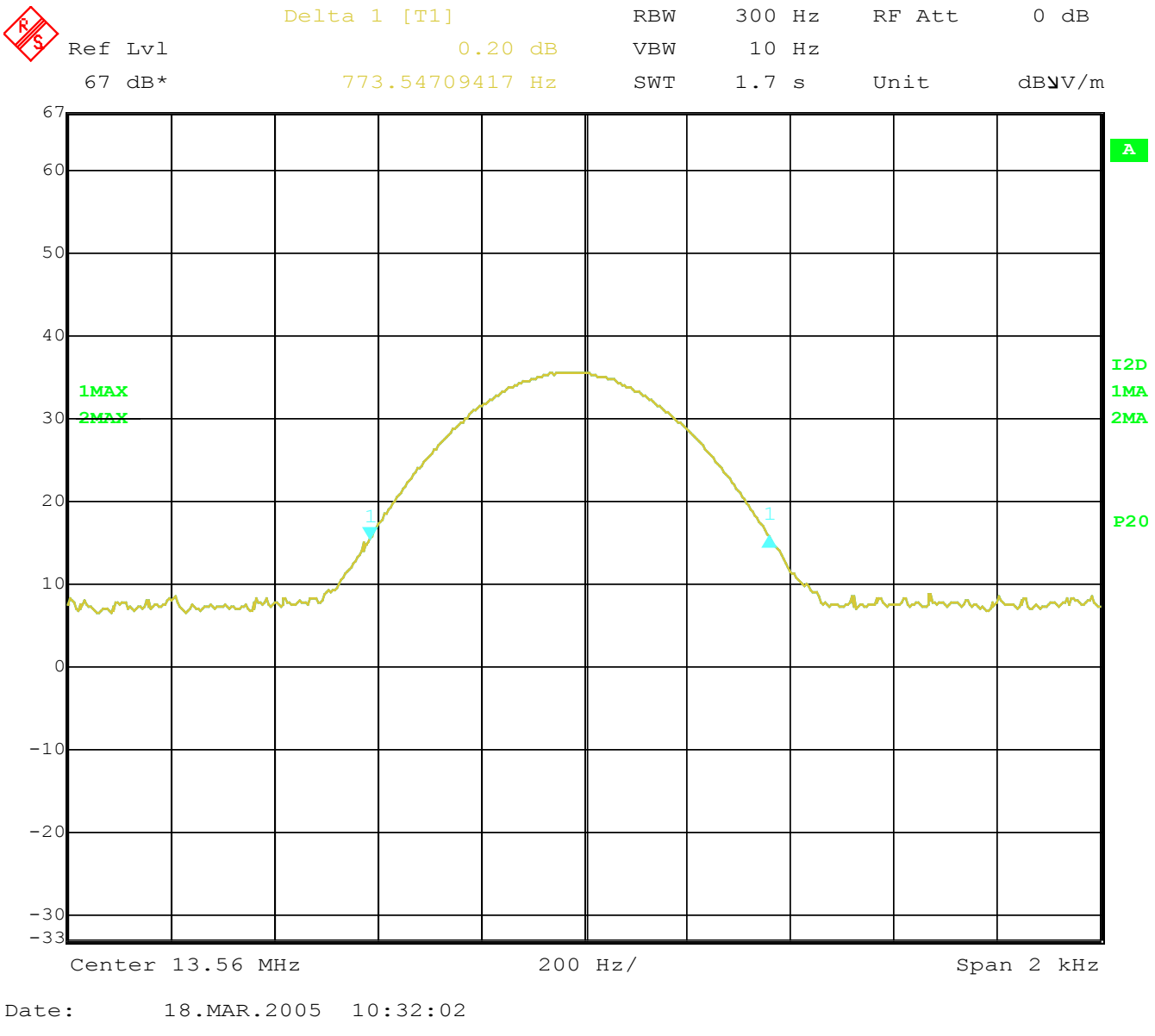
Bandwidth Measurement

DATA ON 110v Lexmark C920 Printer, Type/Model: 5056-000
MODE: Printing Parallel @ 32ppm



DESCRIPTION OF MEASUREMENT PROCEDURES

Radiated

Radiated EMI testing was performed at the registered 10 meter chamber test facility located at Lexmark International Inc. in Lexington, Ky. This test facility has been recognized by the FCC and Industry Canada, (File Number IC 2376). The Lexmark C920 printer, (EUT), PC host, and other peripherals were placed in a typical customer configuration atop a 0.8 meter high rotating wooden table with a rectangular surface measuring 1.5m x 1.0m, and were at a distance of 3 meters from a bi-log antenna, (which measures frequencies between 30 - 1000 MHz). When applicable, a horn antenna is used to measure frequencies between 1.0 – 18.0 GHz). For testing below 30MHz, a shielded loop antenna was used and located at a distance of 10m from the EUT. Testing was performed with the antennas in both the horizontal and vertical positions.

The EUT and the PC host were placed with their back at the rear edge of the table. All line cords were draped unbundled over the rear edge of the table and down to the ground plane. Interconnecting cables, (all parallel, serial, USB cables, etc.), were draped down from the rear of the PC host and the EUT printer, but hung no closer than 40cm to the ground plane. The excess of these parallel / serial cables were serpentined to form a bundle 30-40cm in length, with the overall length of the cable not to exceed 1.0 meter in length, if possible. The mouse and keyboard cables were placed as close as possible to the PC host. This arrangement of equipment and cables complies with the specifications described in the ANSI C63.4 document.

The receiving antenna was connected to a spectrum analyzer / interference receiver with a quasi-peak detector. When an interference signal was detected, the table was rotated until the maximum position for that signal was found. The bilog antenna position was then scanned from a height of 1 to 4 meters to determine the maximum antenna location for that signal. The cables were moved around and manipulated to maximize the signal. As a last check, the table was again rotated to assure the maximum azimuth. The resulting signal reading was recorded as the maximum radiated interference level for that frequency. Both horizontal and vertical antenna orientations were measured

CONDUCTED INTERFERENCE - DATA TABLE

DATA ON 110v LEXMARK C920, TYPE/MODEL 5056-000
MODE: Printing Parallel @ 32ppm

FREQ. MHz.	TEST TYPE	* LISN FACTOR	Q-P AMP dB(µV)	FCC Q-P LIMIT dB(µV)	MARGIN dB Q-P	AVE AMP dB(µV)	FCC AVE LIMIT dB(µV)	MARGIN dB AVE.
13.561	Neutral	10.86	40.47	60.00	19.53	17.76	50.00	32.24
27.120	Neutral	10.84	22.89	60.00	37.11	16.87	50.00	33.13
13.560	Phase	10.86	41.13	60.00	18.87	40.21	50.00	9.79
27.120	Phase	10.84	21.12	60.00	38.88	16.64	50.00	33.36

(Temperature at time of testing was 74 deg. F.)

NOTE: A search was made of the frequency spectrum from 150 kHz. To 30 MHz. Both phase and neutral power lines, and printing and idle modes were measured. Only the worst case interference is listed. The measurement results indicate that all frequencies associated with the intentional radiator of the EUT are below the **FCC Part 15** limits. Only the worst case interference is listed.

Q-P Margin dB = Limit – Q-P Amplitude
* LISN Factor is included in Q-P Amplitude

PROCEDURE: TESTING PERFORMED PER ANSI C63.4 (2003), RSS - 210

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Report Produced and Compiled By: Stephen G. Parker (Lexmark)
Official Signatory: Keith Hardin (Lexmark)
Conducted EMI Testing performed By: John Fessler (Lexmark)

DESCRIPTION OF MEASUREMENT PROCEDURES - CONDUCTED

Conducted

Conducted EMI testing was performed in an 18 ft. x 18 ft. all-welded shielded enclosure, located at Lexmark International's registered EMC test site facilities. The Lexmark C920 printer, (EUT), PC host, and all peripherals were tested in a typical customer configuration inside a shielded room. They were placed atop a 0.8 meter high wooden table with a rectangular surface measuring 1.5m x 1.0m, with the printer's back edge located 40 cm from the wall, (a vertical ground plane). This printer was tested in a floor standing configuration.

The EUT line cord was plugged into a Rhode & Schwarz LISN (Line Impedance Stabilization Network), with all EUT excess line cord length serpentined in the center to form a bundle 30-40cm in length. Excess line cord lengths of peripherals were draped down vertically to the floor with excess laying on the ground plane, and plugged into a power outlet strip. All EUT, printer cables, serial cables, etc. were draped down from the rear of the printer and peripherals, but hung no closer than 40cm to the floor (ground plane). The excess of these parallel / serial / communication cables were serpentined to form a bundle 30-40cm in length, with the overall length of the cable not to exceed 1.0 meter in length, when possible. The mouse and keyboard cables were placed as close as possible to the PC host.
This arrangement of equipment and cables complies with the specifications described in the C63.4 document.

The EUT LISN was bonded to the shielded room ground plane. Shielded cables were connected between the EUT LISN, and a spectrum analyzer / receiver, which was located in an adjacent shielded room. The printer and other peripherals were connected to the host system unit. The cables were then manipulated to maximize emissions. With the cables in this maximized position, the Quasi-peak data was collected and recorded.

NOTE:

The following conditions apply to this report:

The official Certification document nor this report shall not be --

1. **reproduced without the permission of the Lexmark EMC Department, nor**
2. **reproduced, except in full.**