TEST RESULT SUMMARY

FCC PART 15 SUBPART C
Section 15.209

MANUFACTURER'S NAME	Eastman Kodak
NAME OF EQUIPMENT	8700 RFID Tag Rollback Upgrade Kit (intentional radiator) in DryView 8700 Laser Imager (Medical Film Printer)
MODEL NUMBER	**M8700**
MANUFACTURER'S ADDRESS	1 Imation Way Oakdale MN 55128
TEST REPORT NUMBER	NC202018
TEST DATE	11 April 2002

According to testing performed at TÜV Product Service Inc, the above-mentioned unit is in compliance with the electromagnetic compatibility requirements defined in FCC Part 15 Subpart C section 15.209.

It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics. Any modifications necessary for compliance made during testing on the above mentioned date(s) must be implemented in all production units for compliance to be maintained.

TÜV Product Service Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the requirements of FCC Part 15 Subpart C section 15.209.

Date: 08 May 2002

Location: Taylors Falls MN USA

G. S. Jakubowski
Test Engineer

T. K. Swanson
EMC Technical Writer

Not Transferable

"Raymond Laforge" <RLAFORGE@fcc.gov>

04/24/02 01:52 PM

To: <don.ertl@kodak.com>
cc:
Subject: Re: Class II Permissive Change

This fits into the definition of a Class II change. The emissions changes (increased in this case) but still pass the Commission's requirments.

>>> <don.ertl@kodak.com> 04/24/02 02:35PM >>>
Hello Ray,
To recap my conversation with you regarding our Class II Permissive Change, our FCC identifier (PA4870085007E2620) was originally submitted February 2001 and approved. Our device is a medical laser imager which utilizes a RF tag to read the film cartridge internally. This allows our device to "read" the film cartridge. This RF tag was commercialized to replace a barcode subsystem. We have been experiencing a relatively small number of field issues which causes a no read of the cartridge. Our design change, in order to make the RF system more robust was to change some of the passive components. Along doing so our field strength did increase. This change is to the antenna board only. We brought the system up for a verification test to TUV Product Service's Wild River Lab where we had the original testing done. It should be noted that our levels are still way below the limit and were found to be 42 dBuV at 3 meters, at 10 meters our levels were at baseline. We will be submitting the original test report, the data from the new measurements, schematics and photos to the TCB. Is there any other documentation that you will be requiring for this Class II Permissive Change. Being that this change is to address an issue in the field, any assistance would be greatly appreciated. It was a pleasure talking with you earlier.

Best Regards,

Don Ertl
Regulatory Affairs Product Manager
(t) 651-393-1020

 - TEXT.htm

EMC EMISSION - T E S T R E P O R T

Test Report File No.	:	**NC202018**	Date of issue:	08 May 2002

Model / Serial No.	:	**M8700 /**
Product Type	:	8700 RFID Tag Rollback Upgrade Kit (intentional radiator) in DryView 8700 Laser Imager (Medical Film Printer)
Applicant	:	Eastman Kodak
Manufacturer	:	Eastman Kodak
License holder	:	Eastman Kodak
Address	:	1 Imation Way
	:	Oakdale MN 55128
Test Result	:	■ **Positive** ☐ **Negative**
Test Project Number Reference(s)	:	**NC202018**
Total pages including Appendices		21

TÜV Product Service Inc is a subcontractor to TÜV Product Service, GmbH according to the principles outlined in ISO/IEC Guide 25 and EN 45001.

TÜV Product Service Inc reports apply only to the specific samples tested under 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 components. TÜV Product Service Inc shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV Product Service Inc issued reports.

This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval. This report shall not be used by the client to claim product endorsement by NVLAP or any agency of the US government.

TÜV Product Service Inc and its professional staff hold government and professional organization certifications and are members of AAMI, ACIL, AEA, ANSI, IEEE, NVLAP, and VCCI

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D I R E C T O R Y - EMISSIONS

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0

EMISSIONS TEST REGULATIONS :

The emissions tests were performed according to following regulations:

☐ - EN 50081-1 / 1991

☐ - EN 55011 / 1991 ☐ - Group 1 ☐ - Group 2
☐ - Class A ☐ - Class B

☐ - EN 55013 / 1990

☐ - EN 55014 / 1987 ☐ - Household appliances and similar
☐ - Portable tools
☐ - Semiconductor devices

☐ - EN 55014 / A2:1990

☐ - EN 55014 / 1993 ☐ - Household appliances and similar
☐ - Portable tools
☐ - Semiconductor devices

☐ - EN 55015 / 1987

☐ - EN 55015 / A1:1990

☐ - EN 55015 / 1993

☐ - EN 55022 / 1987 ☐ - Class A ☐ - Class B

☐ - EN 55022 / 1994 ☐ - Class A ☐ - Class B

☐ - BS

☐ - VCCI ☐ - Class A ☐ - Class B

■ - FCC Part 15 Subpart C Section 15.209

☐ - FCC Part 15 Subpart B ☐ - Class A ☐ - Class B

☐ - CISPR 11 (1990) ☐ - Group 1 ☐ - Group 2
☐ - Class A ☐ - Class B

☐ - CISPR 22 (1993) ☐ - Class A ☐ - Class B

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Environmental conditions in the lab:

	Actual
Temperature	: 23 °C
Relative Humidity	: 31 %
Atmospheric pressure	: 98.8 kPa
Power supply system	: 60 Hz – 208 VAC – 1 Phase

Sign Explanations:

☐ - not applicable
■ - applicable

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RADIATED EMISSIONS (15.209 - 10 kHz to 30 MHz)

Radiated emissions 10 kHz - 30 MHz

The requirements are ■ - MET ☐ - NOT MET

Minimum limit margin for fundamental 15 dB at 13.56 MHz

Minimum limit margin for harmonics/spurious >10 dB at _____ MHz

No signals could be detected from the eut at a 10 meter antenna distance. Measurements were made at 1 and 3 meters in order to establish the falloff rate of the measured signal(s), and this rate was used to extrapolate the measured value(s) out to 10 or 30 meters, as appropriate. No harmonics or spurious emissions were detected.

The *RADIATED EMISSIONS (10 KHZ TO 30 MHZ)* measurements were performed at the following test location:

■ - Wild River Lab Large Test Site (Open Area Test Site)

at a test distance of :

☐ - .3 meters
■ - 1 meters
■ - 3 meters

Test equipment used :

	TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	2420	ESH-3	Rhode & Schwarz	EMI Receiver	892473/004	3-22-03
■ -	2517	HFH2-Z2	Polorad	Loop Antenna	879285/036	2-11-03

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dBuV/m	margin
MHz	0.3 m	1 m	3 m	10 m	30 m	30 m Limit	300 m	300 m Limit	dB
0.009								48.5193746	
0.49						53.8003			
0.49						33.8003			
1.705						22.96974			
1.705						29.54243			
13.56		**56**	**42**	**28**	**14**	**29.54243**			**15.54243**
30						29.54243			
Quasi-Peak Detection									
Noise Floor level = 29 dBuV/m									
Levels at 1 and 3 M are measured - Levels at 10 and 30 M are extrapolated									
Tested By: G. S. Jakubowski									

In the frequency range of 10 kHz to 30 MHz, a shielded loop antenna is positioned with its plane vertical at 1 and 3 meters from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The loop antenna is also positioned horizontally. The center of the loop antenna is 1 meter above the ground plane. Since the measurements were well within the requirements, the unit was not remeasured off of the ground plane. Measurements between 9 kHz and 30 MHz are made with 9 kHz/6 dB bandwidth and quasi-peak detection with a receiver.

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Emissions Test Conditions: RADIATED EMISSIONS (30-1000 MHz)

The *RADIATED EMISSIONS (ELECTRIC FIELD)* measurements, in the frequency range of 30 MHz-1000 MHz, were tested in a horizontal and vertical polarization at the following test location:

■ - Wild River Lab Large Test Site (Open Area Test Site) – NSA measurements made 7-01, due 7-02

at a test distance of :

■ - 3 meters – no signals detected from the transmitter within 10 dB of the limit.

Test equipment used :

	TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	2733	11867A	Hewlett-Packard	Limiter	01080	3-18-03
■ -		8566B	Hewlett-Packard	Spectrum Analyzer	2115A00853	6-19-02
■ -		85662A	Hewlett-Packard	Analyzer Display	2112A02220	6-19-02
■ -	2679	85650A	Hewlett-Packard	Quasi-Peak Adapter	2430A00550	12-19-02
■ -	2830	ZHL-1042J	Mini-Circuits	Preamplifier	H081396-16	3-15-03
■ -	3203	EM-6917B	Electro-Metrics	Biconicalog Periodic	106	2-14-03

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

Radiated emissions from the EUT are measured in the frequency range of 30 to 1000 MHz using a spectrum analyzer and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection and measurements above 1000 MHz are made with a 1 MHz/6 dB bandwidth and peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimeters above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Interface cables that are closer than 40 centimeters to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimeters from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna is positioned 3 meters horizontally from the EUT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarizations and the EUT are rotated 360 degrees. The final level, expressed in dBµV/m, is arrived at by taking the reading from the spectrum analyzer (Level dBµV), adding the antenna correction factor and cable loss factor, and then subtracting the preamplifier gain.

Example:

FREQ (MHz)	LEVEL (dBuV)	CABLE/ANT/PREAMP (dB)	(dB/m)	(dB)	FINAL (dBuV/m)	POL/HGT/AZ	(m)	(deg)	DELTA1
79.06	40.7Qp +	1.9	+ 6.6	- 28.3 =	20.9	V	1.0	0.0	-9.1

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Equipment Under Test (EUT) Test Operation Mode - Emission tests :

The device under test was operated under the following conditions during emissions testing:

☐ - Standby

☐ - Test program (H - Pattern)

☐ - Test program (color bar)

☐ - Test program (customer specific)

☐ - Practice operation

☐ - Normal Operating Mode

■ - Production release software rev. 1.26 – normal non-printing and printing.

Configuration of the device under test:

■ - See Constructional Data Form in Appendix A - Page A2

☐ - See Product Information Form in Appendix B - beginning on Page B3

The following peripheral devices and interface cables were connected during the measurement:

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

■ - unshielded power cable

☐ - unshielded cables

■ - shielded cables MPS.No.: _____

☐ - customer specific cables

☐ - _____

☐ - _____

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DEVIATIONS FROM STANDARD:

None.

GENERAL REMARKS:

SUMMARY:

The requirements according to the technical regulations are

■ - met

☐ - **not** met.

The device under test does

■ - fulfill the general approval requirements mentioned on page 3.

☐ - **not** fulfill the general approval requirements mentioned on page 3.

Testing Start Date: 11 April 2002

Testing End Date: 11 April 2002

- TÜV PRODUCT SERVICE INC -

Thomas K. Swanson

T. K. Swanson
EMC Technical Writer

Tested By:
G. S. Jakubowski

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Test-setup photo(s):
Radiated emission 10 kHz - 1000 MHz

See Test-Setup Exhibit

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Appendix A

Constructional Data Form

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0

Form

EMC Test Plan and Constructional Data Form

PRODUCT SERVICE

PLEASE COMPLETE THIS DOCUMENT IN FULL, ENTERING N/A IF THE FIELD IS NOT APPLICABLE.

Applicant -- ***NOTE: This information will be input into your test report as shown below.***
Press the F1 key at any time to get HELP for the current field selected.

Company: Eastman Kodak

Address: 1 Imation Way
Oakdale, MN 55128
Discovery 3B-61

Contact: Kevin Reller Position: Sr. EE

Phone: (651) 393 - 1423 Fax: (651) 393 - 1440

E-mail Address: kevin.reller@kodak.com

General Equipment Description -- ***NOTE: This information will be input into your test report as shown below.***

EUT Description: Medical Film Printer

EUT Name: DryView 8700 Laser Imager

Model No.: M8700 Serial No.:

Product Options: Video and Digital

Configurations to be tested: Video and Digital

Test Objective

- ☐ EMC Directive 89/336/EEC (EMC) Std:
- ☐ Machinery Directive 89/392/EEC (EMC Std:
- ☐ Medical Device Directive 93/42/EEC (EMC) Std:
- ☐ Vehicle Directive 72/245/EEC (EMC) Std:
- ☐ FDA Reviewers Guidance for Premarket Notification Submissions (EMC)

- ☐ FCC: Class ☐ A ☒ B Part 15
- ☐ VCCI: Class ☐ A ☐ B
- ☐ BCIQ: Class ☐ A ☐ B
- ☐ Canada: Class ☐ A ☒ B
- ☐ Australia: Class ☐ A ☐ B
- ☒ Other: R&TTE Directive

TÜV Product Service Certification Requested

- ☐ Attestation of Conformity (AoC)
- ☐ Certificate of Conformity (CoC)
- ☐ International EMC Mark (IEM)
- ☐ Compliance Document

Protection Class (N/A for vehicles) ☐ Class I ☐ Class II ☐ Class III

(Press **F1** when field is selected to show additional information on Protection Class.)

Attendance

Test will be: ☒ Attended by the customer ☐ Unattended by the customer

Form

EMC Test Plan and Constructional Data Form

Failure ***- Complete this section if testing will not be attended by the customer.***

If a failure occurs, TUV Product Service should:

☐ Call contact listed above, if not available then stop testing. (After hrs phone): _____

☐ Continue testing to complete test series.

☐ Continue testing to define corrective action.

☐ Stop testing.

EUT Specifications and Requirements

Length: 32.0 in Width: 26.0 in Height: 50.4 in Weight: 550

Power Requirements

Regulations require testing to be performed at typical power ratings in the countries of intended use. (i.e., European power is typically 230 VAC 50 Hz or 400 VAC 50 Hz, single and three phase, respectively)

Voltage: 200/220/240 (If battery powered, make sure battery life is sufficient to complete testing.)

# of Phases: 1

Current (Amps/phase(max)): 9.4/8.5/7.8 A Current (Amps/phase(nominal)): 3-4 A

Other _____

Other Special Requirements

Typical Installation and/or Operating Environment

(ie. Hospital, Small Business, Industrial/Factory, etc.)
Hospital, Medical Clinic

EUT Power Cable

☐ Permanent OR ☒ Removable Length (in meters): 2

☐ Shielded OR ☒ Unshielded

☐ Not Applicable

EMC Test Plan and Constructional Data Form

TÜV PRODUCT SERVICE

EUT Interface Ports and Cables

Interface			Shielding							
Type	Analog / Digital	Qty	Yes / No	Type	Termination	Connector Type	Port Termination	Length (in meters)	Removable / Permanent
EXAMPLE: *RS232*	☐ ☒	*2*	☒ ☐	*Foil over braid*	*Coaxial*	*Metallized 9-pin D-Sub*	*Characteristic Impedance*	*6*	☒ ☐
Video	☒ ☐	1	☒ ☐	Triax	Coaxial	BNC	50 Ohm	30	☒ ☐
Digital	☐ ☒	1	☒ ☐	Foil over Braid	Straight Pin	37 Pin D-Sub	50 Ohm	30	☒ ☐
Keypad	☐ ☒	1	☒ ☐	Foil over Braid	Straight Pin	26 pin D-Sub	50 Ohm	3	☒ ☐
Network	☐ ☒	1	☒ ☐	Foil	Straight Pin	RJ 45	50 Ohm	3	☒ ☐
	☐ ☐		☐ ☐						☐ ☐
	☐ ☐		☐ ☐						☐ ☐
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	☐ ☐		☐ ☐						☐ ☐

Form

EMC Test Plan and Constructional Data Form

TÜV PRODUCT SERVICE

EUT Software.

Revision Level: 1.26

Description: Production Release

EUT Operating Modes to be Tested -- list the operating modes to be used during test. It is recommended the equipment be tested while operating in a typical operation mode. FCC testing of personal computers and/or peripherals requires that a simple program generate a complete line of upper case H's. Provide a general description of all software, firmware, and PLD algorithms used in the equipment. List all code modules as described above, with the revision level used during testing. Consult with your TÜV Product Service Representative if additional assistance is required.

1. Normal non printing and printing

2.

3.

EUT System Components -- List and describe all components which are part of the EUT. For FCC testing a minimum configuration is required. (ie. Mouse, Printer, Monitor, External Disk Drive, Motherboard, etc.)

Description	Model #	Serial #	FCC ID #
Keypad	8700 Keypad	VK8700762	

Form

EMC Test Plan and Constructional Data Form

TÜV PRODUCT SERVICE

Support Equipment -- List and describe all support equipment which is not part of the EUT. (i.e. peripherals, simulators, etc)

Description	*Model #*	*Serial #*	*FCC ID #*
Video generator			

Oscillator Frequencies

Frequency	*Derived Frequency*	*Component # / Location*	*Description of Use*
20 mhz		Dual Printer Board	Timing
10 mhz		Fiber Interface Board	"
3.6864 mhz		Host Interface Board	"
33.33 mhz		Image Processor Board	"
32.678 mhz		System Control Board	"
16 mhz		Trans Daughter Board	"

Power Supply

Manufacturer	*Model #*	*Serial #*	*Type*
Condor	MSP 1327		☒ Switched-mode: (Frequency) _____ ☐ Linear ☐ Other: _____
C&D Technologies	PX400-U45_BNH-PLN		☒ Switched-mode: (Frequency) _____ ☐ Linear ☐ Other: _____

Power Line Filters

Manufacturer	*Model #*	*Location in EUT*
Corcom	10EBH1	Line Filter

Form

EMC Test Plan and Constructional Data Form

Critical EMI Components (Capacitors, ferrites, etc.)

Description	*Manufacturer*	*Part # or Value*	*Qty*	*Component # / Location*
Ferrite	Steward	28B2024-0A0	3	Local Panel, Optics data, Optics Control Cables
Ferrite	FerriShield	TC28B1500	1	Module Interconnect Harn
Ferrite	FerriShield	FA28B2480	4	IPB/NMB, IPB/SCB, Optics Data, PDB/SCB Cables
Ferrite	FerriShield	SS28B2035 TC28B200	1 2	DC Power Cable Video Input Cable

EMC Critical Detail -- Describe other EMC Design details used to reduce high frequency noise.

Ground strap

(PLEASE INSERT "**ELECTRONIC SIGNATURE**" BELOW IF POSSIBLE)

Authorization Signatures

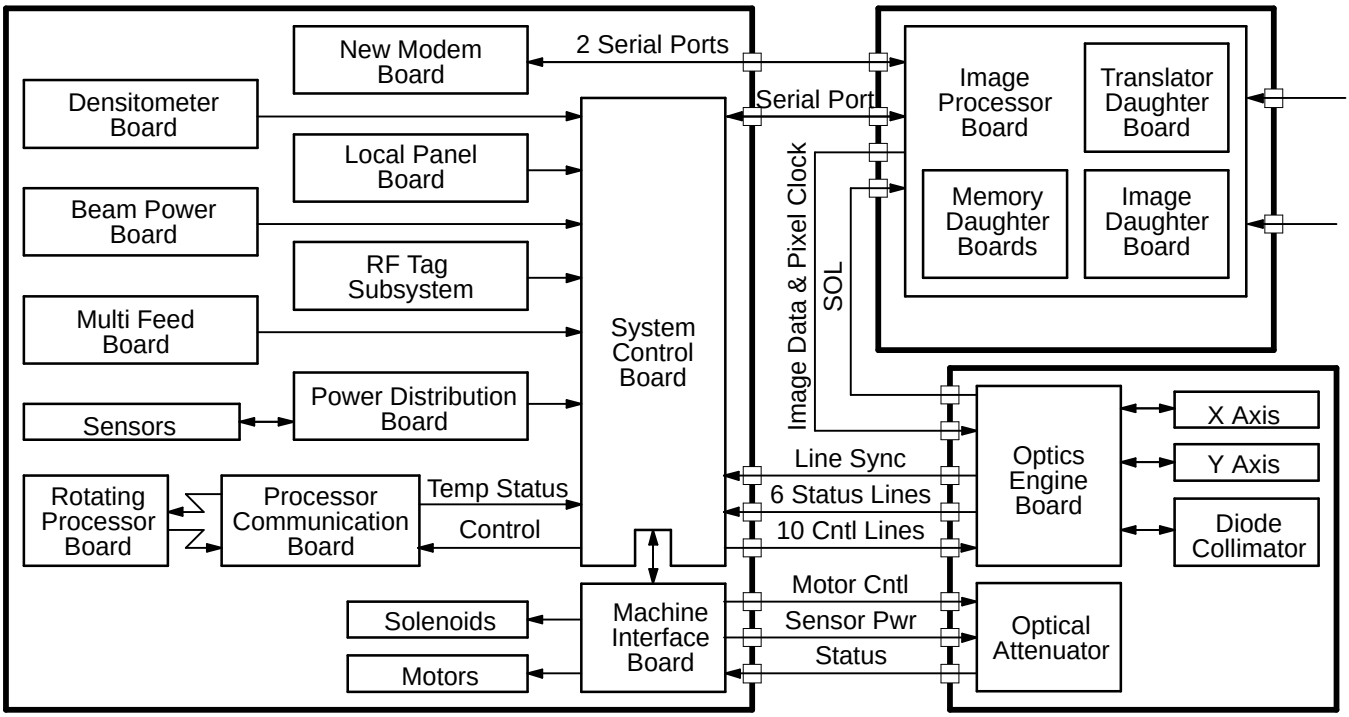
Kevin Reller

Customer authorization to perform tests according to this test plan. — Date

Test Plan/CDF Prepared By (please print) — Date

Kevin Reller

Reviewed by TÜV Product Service Associate — Date


New Modem Board
2 Serial Ports
Densitometer Board
Serial Port
Local Panel Board
Beam Power Board
RF Tag Subsystem
Multi Feed Board
System Control Board
Power Distribution Board
Sensors
Rotating Processor Board
Processor Communication Board
Temp Status
Control
Solenoids
Motors
Machine Interface Board
Image Data & Pixel Clock
SOL
Line Sync
6 Status Lines
10 Cntl Lines
Motor Cntl
Sensor Pwr
Status
Image Processor Board
Translator Daughter Board
Memory Daughter Boards
Image Daughter Board
Optics Engine Board
Optical Attenuator
X Axis
Y Axis
Diode Collimator

Summarization of the change to the RF Antenna Board:

After approximately 9 months of production of the RF tag upgrade to the 8700 Medical Laser Imager we encountered field issues, resulting from a mismatch in the antenna impedance. This change is to make the RF Tag cartridge system more robust.

The antenna matching and tuning circuit was modified to tune to the correct frequency and to increase the robustness of the antenna by including a shunt capacitor. This new design was adopted and tested and found to be superior. Functional testing of this antenna shows that the new antenna corrects all of the observed field issues seen to date. The new antenna was submitted for TUV testing and passed.

No change was required to the antenna coil itself.

-Dr. Terrence Joyce
Kodak Health Imaging

Appendix B

MEASUREMENT PROTOCOL FOR FCC

GENERAL INFORMATION

Test Methodology

Conducted and radiated emission testing is performed according to the procedures in International Special Committee on Radio Interference (CISPR) Publication 22 (1993), European Standard EN 55022 and Australian Standard AS 3548 (which are based on CISPR 22).

The Japanese standard, "Voluntary Control Council for Interference (VCCI) by Data Processing Equipment and Electronic Office Machines, Technical Requirements" is technically equivalent to CISPR 22 (1993). For official compliance, a conformance report must be sent to and accepted by the VCCI.

In compliance with FCC Docket 92-152, "Harmonization of Rules for Digital Devices Incorporate International Standards", testing for FCC compliance may be done following the ANSI C63.4-1992 procedures and using the CISPR 22 Limits.

Measurement Uncertainty

The test system for conducted emissions is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the spectrum analyzer and the coaxial cable. These test systems have a measurement uncertainty of ±4.5 dB. The equipment comprising the test systems are calibrated on an annual basis.

Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral into it's characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

CONDUCTED EMISSIONS

The final level, expressed in dBµV, is arrived at by taking the reading directly from the EMI receiver. This level is compared directly to the FCC limit.

To convert between dBµV and µV, the following conversions apply:

dBµV = 20(log µV)

µV = Inverse log(dBµV/20)

RADIATED EMISSIONS

The final level, expressed in dBµV/m, is arrived at by taking the reading from the spectrum analyzer (Level dBµV) and adding the antenna correction factor and cable loss factor, and subtracting the preamplifier gain, to it. This result then has the duty cycle correction factor subtracted from it to provide the final average reading.

Example:

FREQ (MHz)	LEVEL (dBuV)	CABLE/ANT/PREAMP (dB) (dB/m) (dB)	FINAL (dBuV/m)	POL/HGT/AZ (m) (deg)	DELTA1
79.06	40.7Qp +	1.9 + 6.6 - 28.3 =	20.9	V 1.0 0.0	-9.1

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DETAILS OF TEST PROCEDURES

General Standard Information

The test methods used comply with ANSI C63.4-1992 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

Conducted Emissions

Conducted emissions on the 60 Hz power interface of the EUT are measured in the frequency range of 450 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection, and a Line Impedance Stabilization Network (LISN), with 50 Ω/50 μH (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimeters above the floor and is positioned 40 centimeters from the vertical ground plane (wall) of the screen room. In some cases, a pre-scan using a spectrum analyzer is initially performed on the units comprising the system under test to locate the highest emissions. If the minimum passing margin appears to be less than 20 dB with a peak mode measurement, the emissions are re-measured using a tuned receiver or spectrum analyzer with quasi-peak and average detection and recorded on the data sheets.

Radiated Emissions

Radiated emissions from the EUT are measured in the frequency range of 30 to 1000 MHz using a spectrum analyzer and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection and measurements above 1000 MHz are made with a 1 MHz/6 dB bandwidth and peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimeters above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Interface cables that are closer than 40 centimeters to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimeters from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna is positioned 3 meters horizontally from the EUT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarizations and the EUT are rotated 360 degrees. Intentional radiators are rotated through three orthogonal axes to determine the attitude that maximizes the emissions.

In the frequency range of 10 kHz to 30 MHz, a shielded loop antenna is positioned with its plane vertical at 0.3 and 1 meters from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The loop antenna is also positioned horizontally. The center of the loop antenna is 1 meter above the ground plane. Since the measurements were well within the requirements, the unit was not remeasured off of the ground plane. Measurements between 9 kHz and 30 MHz are made with 9 kHz/6 dB bandwidth and quasi-peak detection with a receiver.

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0