

Appendix II

Test Report Cover Sheet

COMPANY NUMBER: 3506A

MODEL NUMBER: APS 1000

MANUFACTURER: Sensormatic Electronics Corporation

TESTED TO RADIO STANDARD SPECIFICATION NO. : RSS 210

OPEN AREA TEST SITE INDUSTRY CANADA NUMBER: 3506

FREQUENCY RANGE (or fixed frequency): 58

R.F. POWER IN WATTS: na

FIELD STRENGTH (at what distance): 15.9 dBuV/m @300 m

OCCUPIED BANDWIDTH (99% BW): 4.2 kHz

TYPE OF MODULATION: Pulse

EMISSION DESIGNATOR (TRC-43): 4K20P0N

TRANSMITTER SPURIOUS (worst case): -5.8 dBuV

RECEIVER SPURIOUS (worst case): na; transmitter on continuously

ATTESTATION: I attest that the testing was performed or supervised by me; that the test measurements were made in accordance with the above mentioned departmental standard(s), and that the radio equipment identified in this application has been subject to all the applicable test conditions specified in the departmental standards and all of the requirements of the standard have been met.

Signature:



Date: October 21, 2002

NAME AND TITLE (Please print or Type):

Donald J. Umbdenstock

Sr. Principal Engineer, Compliance Engineering

Note: This form must be completed and provided with the submission.

FCC ID: BVCAPS1000
IC: 3506A – APS1000

COMPANY	Sensormatic Electronics Corp. 6600 Congress Ave Boca Raton, Florida
PRODUCT TESTED	APS 1000 FCC ID: BVCAPS1000 IC: 3506A-APS1000
FCC RULES	15.207, 15.209
IC SPECIFICATIONS	RSS 210
TEST DATE	October 9 – October 16, 2002
SUBMITTED BY	Donald J. Umbdenstock

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I. Summary of Results

47 CFR 15.207	CONDUCTED EMISSIONS	COMPLIES
47 CFR 15.209	RADIATED EMISSIONS	COMPLIES
RSS 210: 5.9.1	OCCUPIED BANDWIDTH	PROVIDED

II. General Information

1.1 Test Methodology

Both conducted and radiated emissions testing were performed according to the procedures in ANSI C63.4-1992, and the requirements of 15.31, 15.33, 15.35, 15.207, and 15.209. Radiated emissions measurements below 30 MHz were performed at a distance of 10 meters and the results extrapolated to the distance specified per 15.31 and 15.209. The auxiliary device operating at 900 MHz complies with the requirements of 15.247 per the previous submission under FCC ID: BVCDEACSLNK.

1.2 Test Facility

Measurements per 15.207 and 15.209 were performed at Sensormatic Electronics Corporation.

The shielded room conducted emissions measurement facility and the radiated emissions Open Area Test Site are located at Sensormatic Electronics Corporation Headquarters at 6600 Congress Avenue, Boca Raton, Florida 33487. These sites have been found acceptable by and are on file with the FCC per FCC Registration Number 90925, and Industry Canada per file number IC 3506.

1.3 Test System Description.

The system consists of 2 pedestals, one called a primary and the other called a secondary. The primary pedestal houses loop antennas and electronics for transmit, receive, alarm and data processing electronics. The secondary pedestal houses a loop antenna and tuning circuit only. The pedestal system operates at 58 kHz, detecting an acousto-magnet tag placed within the field generated by the pedestals.

In some applications, the system also includes a previously authorized auxiliary device identified as Sync Link (FCC ID: BVCDEACSLNK). The device provides a RF link to synchronize nearby 58 kHz devices. The Sync Link device is located inside of the primary pedestal below the pedestal's transmitter assembly and operates at 900 MHz, transmitting at a 5 mW level.

The product tested was a pre-production unit built to production drawings. The system was tested with the Sync Link installed.

15.203. The antenna is an internal integral antenna, therefore the antenna is compliant with the requirements of this clause.

III. Conducted Emissions

15.207. Conducted emissions data are presented in Section VIII "Data", Part A, Conducted Emissions. The product demonstrated compliance with the requirements. The product was tested at 120 V, 60 Hz.

IV. Radiated Emissions

15.209. Radiated emissions data for this product are presented in Section VIII "Data", Part B, Radiated Emissions. The product demonstrated compliance with the requirements. Radiated emissions measurements were performed at 10 meters. Propagation loss was determined by extrapolating the results to 300 meters as per 15.31(f)(2), using the 2 point roll-off extrapolation method.

Maximum radiation was determined by first assessing symmetry while applying incremental rotation of the product. The product exhibited quadrant symmetry. Measurements were taken at radials of 22.5° throughout one quadrant. The measurement antenna was rotated for maximum pickup about the vertical and horizontal axis of the measurement antenna at the radial of the EUT with the maximum emission. The maximum emission was determined to be with the measurement loop antenna in the vertical polarization, parallel to the plane of the transmit loop antenna.

The product was tested at input voltages to the transformer ranging from 102 – 138 V, 60. See Section VIII, Part B.

V. Occupied Bandwidth

RSS 210:5.9.1. The 20 dB bandwidth measurements for this product are presented in Section VII “Data”, Part C, Occupied Bandwidth. A bandwidth requirement was not specified for 58 kHz products, so the default 20 dB bandwidth was measured. The HP 8591EM spectrum analyzer cannot measure a bandwidth over 1.8 kHz in quasi-peak detection mode, so the bandwidth was measured in peak detection mode, providing a worst case occupied bandwidth.

VI. RF Exposure Compliance Requirements

The recommended installation location of the Sync Link transmitter is inside the pedestal below the Electronic Article Surveillance transmitter. Any persons walking by the pedestal to which the Sync Link is attached will be greater than 20 cm away. The power radiated by Synk Link is approximately 5 mW. Based on the low power and separation distance, the device complies with the RF exposure requirements.

VII. LIST OF MEASURING EQUIPMENT

The equipment used for determining compliance of the Ultra Post system with the requirements of 15.207 and 15.209 is marked with an “X” in the first column of the table below.

	<u>Model</u>	<u>Description</u>	<u>Vendor</u>	<u>Serial #</u>
X	ALP -70	Loop Antenna	Electro Metrics	163
	3110B	Biconnical Antenna	Electro Metrics	1017
	3146	Log Periodic Antenna	EMCO	3909
	3825/2	Line Imp Stable Network	EMCO	1562
X	3816/2NM	Line Imp Stable Network	EMCO	9703 1064
	6060B	Frequency Generator	Giga-tronics	5850202
	FM2000	Isotropic Field Monitor	Amplifier Research	15171
	FP2000	Isotropic Field Probe	Amplifier Research	15214
	888	Leveler	Amplifier Research	14998
	75A220	Low Band Amplifier	Amplifier Research	15208
	10W1000A	High Band Amplifier	Amplifier Research	15138
	PEFT Junior	EFT Generator	Haefely Trench	083 180-16
	PEFT Junior	Capacitive Cable Clamp	Haefely Trench	083-078-31
	NSG435	ESD Simulator	Schaffner	1197
	NSG431	ESD Simulator	Schaffner	1267
X	HP8591EM	EMC Analyzer	Hewlett - Packard	3520A00190
		Power Source	Pacific Instruments	
	F-2031	EM Injection Clamp	Fischer Cust. Comm.	30
	FCC-801-M3-16	Coupling Decoupling Nwk	Fischer Cust. Comm.	58
	FCC-801-M3-16	Coupling Decoupling Nwk	Fischer Cust. Comm.	59
	F-33-1	RF Current Probe	Fischer Cust. Comm.	304
	EM 7600	Transient Limiter	Electro-Metrics	187
	Roberts Ant	Tunable Dipole Set	Compliance Design	003282
	Roberts Ant	Tunable Dipole Set	Compliance Design	003283
	HP8594E	Spectrum Analyzer	Hewlett Packard	3246A00300
X	HP8447F Opt 64	Dual Preamplifier	Hewlett Packard	2805A03473

VIII. Data

Part A contains conducted emissions data; Part B contains magnetic field radiated emissions data; Part C contains occupied bandwidth data.

Part A

Conducted Emissions

Project Name	Conducted Emissions FCC Class B Limit	Filename	
EUT Name	APS 1000	Serial Number	
Engineer	Guillermo Padula	Phone Number	
Date of Test	10/11/2002	Test Name	Conducted Emission
Reg. Technician	Stephen Krizmanich	Reviewed By	Don Umbdenstock

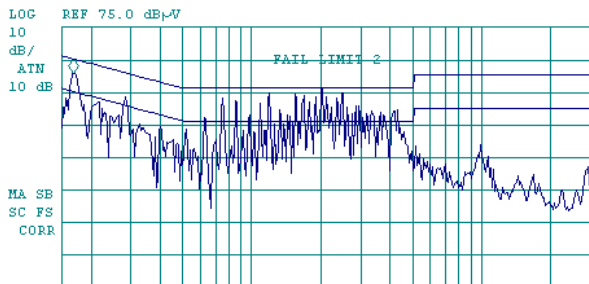
Comments	Line In: 120vac 60hz
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Signal List

Signal	Freq (MHz)	Peak Amp (dBuV)	QP Amp (dBuV)	Avg Amp (dBuV)	QP / Avg Limits (dBuV)	Comments
1	.1745	60.5	55.6	31.7	64.7/54.7	Complies
2	2.02	55.5	52.3	25.1	56.0/46.0	Complies
3	1.21	54.0	52.0	29.0	56.0/46.0	Complies
4	.290	54.4	51.6	28.4	61.0/51.0	Complies
5	1.67	54.0	51.6	26.7	56.0/46.0	Complies
6	2.48	54.3	50.7	20.7	56.0/46.0	Complies

11:11:23 OCT 11, 2002
APS1000 FCC Class B Limit L1

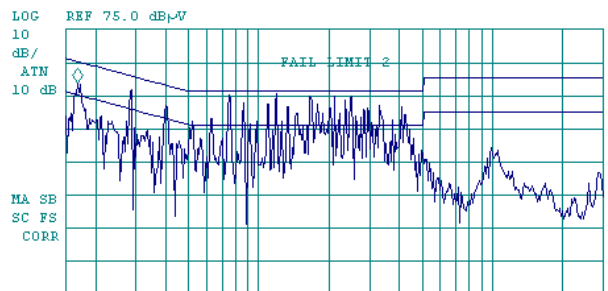
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 170 kHz
60.61 dBuV



START 150 kHz
#IF BW 9.0 kHz
AVG BW 30 kHz
STOP 30.00 MHz
SWP 1.40 sec

11:15:10 OCT 11, 2002
APS1000 FCC Class B Limit L2

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 170 kHz
58.64 dBuV



START 150 kHz
#IF BW 9.0 kHz
AVG BW 30 kHz
STOP 30.00 MHz
SWP 1.40 sec

Part B

Radiated Emissions

Project Name	Radiated Emissions	Filename	
EUT Name	APS 1000	Serial Number	Prototype
Engineer	Guillermo Padula	Phone Number	
Date of Test	October 11, 2002	Test Name	Radiated Emission
Reg. Staff	Steve Krizmanich	Reviewer	Don Umbdenstock

Comments	1. Average detector specified; peak detector and associated calculations to arrive at average detector measurement used per previous FCC instructions. 2. 2 point extrapolation used. 3. Measurement distance 10 meters
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Freq	S.A.	Det	BW	Ant Fact	ACF	DCF	Actual	Limit
kHz	dBuV			dB		dB	dBuV/m	dBuV/m
58/10	59.4							
58/20	41.3							
58(pwr-15%)	57.2							
58(pwr+15%)	61.5							
58	59.4	pk	9kHz	62.5	-17.4	-88.6	15.9	32.3/300
116	28	pk	9kHz	56.6	-17.4	-88.6	-21.4	26.3/300
174	27.2	pk	9kHz	53.1	-17.4	-88.6	-25.7	22.8/300
232	17.7	pk	9kHz	50.6	-17.4	-88.6	-37.7	20.3/300
290	16.5	pk	9kHz	48.7	-17.4	-88.6	-40.8	18.4/300
348	9.6	pk	9kHz	47.1	-17.4	-88.6	-49.3	16.8/300
406	10.3	pk	9kHz	45.7	-17.4	-88.6	-50.0	15.4/300
464	0.2	pk	9kHz	44.6	-17.4	-88.6	-61.2	14.3/300
522	-3.9	qp	9kHz	43.5	-17.4	-28.6	-6.4	33.3/30
580*	6.4	qp	9kHz	42.6	-17.4	-28.6	3.0	32.3/30

*: Ambient

SA: Spectrum Analyzer

Det: Detector

BW: Band Width

ACF: Average Correction Factor; duty cycle converted to dB.

$$ACF = 20 \log(1.6/22.2) = -17.4 \text{ dB}$$

Where 1.6 is the tx "on" time, 22.2 is the worst case period.

DCF: Distance Correction Factor

$$DCF = 20 \log(\text{Test Dist} / 300)P = 20 P \log(\text{Test Dist} / 300)$$

Where P is the roll-off exponent. P is found as follows:

$$P = (\text{Level(at Distance 1)} - \text{Level(at Distance 2)}) / 20 \log(\text{Distance 2} / \text{Distance 1})$$

$$P = 3$$

Ant Fact: Antenna Factor

Actual: Level = SA + Ant Fact + ACF + DCF. Cable factors are negligible at these frequencies.

Limit: 20 log (limit values, uV)

Part C

Occupied Bandwidth

Project Name	BandWidth Measurement Industry Canada	Filename	
EUT Name	APS 1000	Serial Number	
Engineer	Guillermo Padula	Phone Number	
Date of Test	October 16, 2002	Test Name	BandWidth Measurement
Reg. Staff	Steve Krizmanich	Reviewer	Don Umbdenstock

Comments	Line Input: 120VAC 60Hz
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Test conditions		Modulation Bandwidth (kHz)		
		Low Cut-Off Freq	Nominal Freq	High Cut-Off Freq
		-20 dB	58 kHz	+20 dB
T _{nom} 25°C	V _{nom} 120 V	55.8 kHz	57.85 kHz	60 kHz

Bandwidth set to 100 Hz
Transmitter set to power level reported on previous page.

14:09:45 OCT 14, 2002
APS1000 Modulation BandWidth 120vac
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 55.75 kHz
87.46 dBμV

