FCC PART 15, SUBPART B & C
TEST REPORT

for

ACCESS CONTROL SYSTEM
Model: RK-WL
FCC ID: NNHRKWL

Prepared for

SECURA KEY
A Division of Soundcraft, Inc.
20447 NORDHOFF STREET
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DATE: JANUARY 30, 2001

	REPORT BODY	APPENDICES					TOTAL
		A	***B***	***C***	***D***	***E***	
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GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced in any form except in full, without the written permission of Compatible Electronics.

This report must not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government.

Device Tested: Access Control System
Model: RK-WL
S/N: none

Product Description: *This is an Access Control System low frequency transmitter used to access buildings. The Access Control System works in conjunction with passive encoded access tag(s).*

Modifications: The EUT was modified during the testing in order to comply with the specifications. See the list In Appeddix.

Manufacturer: Secura Key, A Division of Soundcraft Inc.
20447 Nordhoff Street
Chatsworth, CA 91311

Test Dates: November 30, 2000 & December 7, 2000

Test Specifications:
EMI requirements
FCC Title 47, Part 15 Subpart B & C
Test Procedure: ANSI C63.4: 1992.

Test Deviations: The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 450 kHz - 30 MHz.	Complies with the **Class B** limits of FCC Title 47, Part 15 Subpart B.
2	Radiated RF Emissions, 30 MHz – 1000 GHz.	Complies with the **Class B** limits of FCC Title 47, Part 15 Subpart B.
3	Radiated RF Emissions, 125kHz to 1.250MHz.	Complies with the limits of FCC Title 47, Part 15 Subpart C.

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Access Control System Model: RK-WL. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 1992. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the specification limits defined in FCC Title 47, Part 15, Subpart B and C, 15.109 and 15.209.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI tests described herein were performed at the test facility of Compatible Electronics, 2337 Troutdale Drive, Agoura, California 91301.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

Secura Key A Division of Soundcraft Inc.

Frank Tajbakhsh	Electronic Design Engineer

Compatible Electronics, Inc.

Andre D. Khan	Test Technician
Ruby A. Hall	Lab Supervisor

2.4 Date Test Sample was Received

The test sample was received on November 30, 2000.

2.5 Disposition of the Test Sample

The test sample remains at Compatible Electronics.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network

3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this EMI Test Report.

SPEC	TITLE
FCC Title 47, Subpart C.	FCC Rules - Intentional Radiators.
FCC Title 47, Subpart B.	FCC Rules – Radio frequency devices (including digital devices).
CISPR 16 1993	Specification for radio disturbance and immunity measuring apparatus and methods.
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.

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - EMI

The EUT was set up in a tabletop configuration. The EUT was mounted on a stand which simulates a vertical installation. A 1 meter cable is connected to the back of the unit. Two of the wires in the cable connect to the power adapter. The remaining wires were unterminated but would normally go to a LED switch panel input and Wiegand output. The EUT was sending out 26 bit Wiegand signals every 10 seconds. Normally the EUT would only send a signal when a keytag is presented to it. The EUT was programmed to transmit every 10 seconds for worst case test levels.

It was determined that the highest emission levels were found in the above configuration. The final radiated and conducted data was taken in this mode of operation. All initial investigations were performed with the Spectrum Analyzer in manual mode scanning the frequency range continuously. Photographs are included in Appendix D.

4.1.1 Cable Construction and Termination

Cable 1 This is a 1 meter unshielded round 6 wire cable connected to the EUT at one end and a .01uF cap on the black wire to earth ground from the EUT to power supply.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NUMBER
ACCESS CONTROL SYSTEM	SECURA KEY	RK-WL	S/N: NONE FCC ID: NNHRKWL
12V DC POWER ADAPTER (Not sold with unit)	BK PRECISION	1670	281-6075

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Spectrum Analyzer	Hewlett Packard	8566A	1904A00188	Jun. 17, 2000	Jun. 17, 2001
Quasi-Peak Adapter	Hewlett Packard	85650A	2043A00276	Jun. 17, 2000	Jun. 17, 2001
Preamplifier	Com Power	PA-102	01249	Apr. 10, 2000	Apr. 10, 2001
RF Attenuator	Hewlett Packard	HP8491A	63334	Apr. 11, 2000	Apr. 11, 2001
LISN (EUT)	Com Power	LI-215	02030	Sep. 26, 2000	Sep. 26, 2001
LISN (Accessory)	Com Power	LI-200	01777	N/A	N/A
LISN (Accessory)	Com Power	LI-200	01779	N/A	N/A
Active Loop Antenna	Com-Power	AL-130	17054	Mar. 30, 2000	Mar. 30, 2001
Biconical Antenna	Com Power	AB-100	01535	Apr. 11, 2000	Apr. 11, 2001
Log Periodic Antenna	Com Power	AL-100	A101	Apr. 11, 2000	Apr. 11, 2001
Antenna Mast	Com Power	AM-400	N/A	N/A	N/A
Turntable	Com Power	TT-106A	N/A	N/A	N/A
Computer	Hewlett Packard	Pavilion 4530	US91912022	N/A	N/A
Printer	Hewlett Packard	C6427B	MY06616OTW	N/A	N/A

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1.2 of this report for EMI test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was grounded with a 24 gauge ring terminal wire and a .01uf capacitor to earth ground.

7. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

7.1 RF Emissions

7.1.1 Conducted Emissions Test

The Spectrum Analyzer was used as a measuring meter along with the quasi-peak adapter. The data was collected with the Spectrum Analyzer in the peak detect mode with the "Max Hold" feature activated. The quasi-peak was used only where indicated in the data sheets. A 10 dB attenuation pad was used for the protection of the Spectrum Analyzer input stage, and the Spectrum Analyzer offset was adjusted accordingly to read the actual data measured. The LISN output was read by the Spectrum Analyzer. The output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for the conducted emissions test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4: 1992. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The initial test data was taken in manual mode while scanning the frequency ranges of 0.15 MHz to 1.6 MHz, 1.6 MHz to 5 MHz and 5 MHz to 30 MHz. The conducted emissions from the EUT were maximized for operating mode as well as cable placement. Once a predominant frequency (within 12 dB of the limit) was found, it was more closely examined with the Spectrum Analyzer span adjusted to 1 MHz.

The final data was collected under program control by the computer in several overlapping sweeps by running the Spectrum Analyzer at a minimum scan rate of 10 seconds per octave. The six highest emissions are listed in Table 1.

7.1.2 Radiated Emissions Test

The spectrum analyzer was used as a measuring meter along with a quasi-peak adapter. A Preamplifier was used to increase the sensitivity of the instrument. The Spectrum Analyzer was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer records the highest measured reading over all the sweeps. This final reading is then recorded automatically by the Computer's automated data recording program, which takes into account the cable loss, amplifier gain and antenna factors, so that a true reading is compared to the true limit. The quasi-peak was used only for those readings, which are marked accordingly on the data sheets. The effective measurement bandwidth used for the radiated emissions test was 120 kHz.

Broadband antennas were used as transducers during the measurement. The Loop antenna was used from 125.0kHz to 1.250MHz, the biconical antenna was used from 30MHz to 300MHz, the Log Periodic antenna was used from 300MHz to 1GHz. The frequency spans were wide (134KHz to 1.340MHz, 30 to 300, 300 to 1 GHz, during preliminary investigations. The final data was taken with a frequency span of 1 MHz. Furthermore, the frequency span was reduced during the preliminary investigations as deemed necessary.

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 1992. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength).

Preliminary testing was done at a distance of 1 meter instead of 3 meters to determine the predominant harmonics and spurious emission frequencies. An open field test site was used for the preliminary investigations. If and when any frequency was found to be above 30 microvolts/meter level (at 1 meter distance), this frequency was recorded as a significant frequency. All significant frequencies are further examined carefully at a reduced frequency span on the spectrum analyzer while changing the antenna height and EUT orientation. The bandwidth of the spectrum analyzer was varied to ensure that pulse desensitization did not occur.

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The test results are listed in table 2.

7.1.3 RF Emissions Test Results

Table 1.0 CONDUCTED EMISSION RESULTS
ACCESS CONTROL SYSTEM Model: RK-WL

Frequency MHz	Emission Level* dBuV	Specification Limit dBuV	Delta dB
11.861	42.91	48.00	-5.09
12.117	43.13	48.00	-4.87
12.378	43.33	48.00	-4.56
12.743	43.06	48.00	-4.94
12.848	42.87	48.00	-5.13
13.747	42.92	48.00	-5.08

Table 2.0 RADIATED EMISSION RESULTS
ACCESS CONTROL SYSTEM Model: RK-WL

Frequency MHz	Meter* Reading dBuV/m	Cable loss**	Antenna Factor ** dB/m	Amplifier Gain ** dB	Dist. Factor dB	Corrected Reading dBuV/m	Spec. Limit dBuV/m	Delta dB
48.01	51.60	1.76	11.63	36.68	0	28.31	40.00	-11.69
56.03	52.20	1.74	10.56	36.70	0	27.80	40.00	-12.20
64.03	52.60	1.70	9.59	36.70	0	27.19	40.00	-12.81
72.03	50.30	1.72	9.14	36.66	0	24.50	40.00	-15.50
80.04	57.30	1.80	9.32	36.50	0	31.92	40.00	-8.08
160.03	52.00	2.40	13.88	36.16	0	32.12	43.50	-11.38

Notes:

* The complete emissions data is given in Appendix E of this report.

** The effective factor includes the cable loss. The correction factors for the antenna and effective gain are attached in Appendix D of this report.

Quasi-Peak Readings

R Restricted Band

7.1.4 RF Emissions Test Results (continued)

Table 2.0 RADIATED EMISSIONS - SPURIOUS
ACCESS CONTROL SYSTEM

The following bands were specifically scanned.

Frequency Band in MHz	RF Energy From Access Control System at 3 meters (uV/m)
0.490 to 0.510	< 100
37.5 to 38.25	< 100
73 to 74.6	< 100
74.8 to 75.2	< 100
108 to 121.94	< 150
123 to 138	< 150
149.9 to 150.05	< 150
156.7 to 156.9	< 150
162.0125 to 167.17	< 150
167.72 to 173.2	< 150
240 to 285	< 200
322 to 335.4	< 200
399.9 to 410	< 200
608 to 614	< 200
960 to 1000	< 500

7.1.5 Sample Calculations

The Preamplifier was used to increase the sensitivity of the spectrum analyzer. A correction factor for the antenna, preamplifier, cable loss and a distance factor (if any), must be applied to the meter reading before a true field strength reading can be obtained. For greater efficiency and convenience, instead of using these correction factors for each meter reading, the specification limit was modified to reflect these correction factors at each frequency, so that the meter readings can be compared directly to the modified specification limit, referred to henceforth as the corrected meter reading limit (CML).

The equation can be derived in the following manner:

Corrected Meter Reading = meter reading + F - G

where: F = antenna factor
G = effective gain (amplifier gain - cable loss)

Therefore, the equation for determining the corrected meter reading limit is:

CML = spec. limit - F + G

A table of corrected meter reading limits was used to permit immediate comparison of the meter reading and determine if the emission level exceeded the specification limit at that frequency. The correction factors for the antenna and the effective gain are attached in Appendix D of this report. The data sheets are attached in Appendix E.

The distance factor D is 0 when the test is performed at a distance of 3 meters.

8. CONCLUSIONS

The Access Control System Model: RK-WL meets all of the requirements of the FCC Title 47, Part 15, Subpart B & C.

APPENDIX A

LABORATORY ACCREDITATIONS

LABORATORY ACCREDITIONS

Compatible Electronics has the following agency accreditations:

National Voluntary Laboratory Accreditation Program - Lab Code: 200063-0

Voluntary Control Council for Interference - Registration Numbers: R-826, C-862, R-653 and C-669

Bureau of Standards and Metrology Inspection - Reference Number: SL2-IN-E-1031

Compatible Electronics is recognized or on file with the following agencies:

Federal Communications Commission

Industry Canada

Radio-Frequency Technologies (Competent Body)

Technology International (Europe) Ltd.

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC Class B specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

Modifications:
1) Added a .01uF cap. from black wire of the EUT to earth ground.
2) Added a Ferrite (Fair-Rite M/N: 2643625102) to the input power side of the cable on the inside of the enclosure.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

ACCESS CONTROL SYSTEM
Model: RK-WL
S/N: NONE

ALSO COVERED UNDER THIS REPORT:

ACCESS CONTROL SYSTEMS
Models: RK-RL,
RK-XL,
RK- (W, R, X,) LH READERS

Differences:
The only differences between these models are the RK-RL has an RS232 output read only application and the RK-XL has an RS485 output read only application. The RK-(W,R,X,) LH readers have the same output application as the RK-RL and the RK-XL plus a hold option. The unit tested was the RK-WL; this reader has a Wiegand output.
All the above options of the RK-WL readers have the same PCBs. Only the firmware differentiates between the model numbers.

Note:
These justifications for the comparisons of additional models to the model tested are not necessarily the opinions or judgments of Compatible Electronics personnel. The manufacturer drew the conclusions.

APPENDIX D

DIAGRAMS, CHARTS AND PHOTOS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

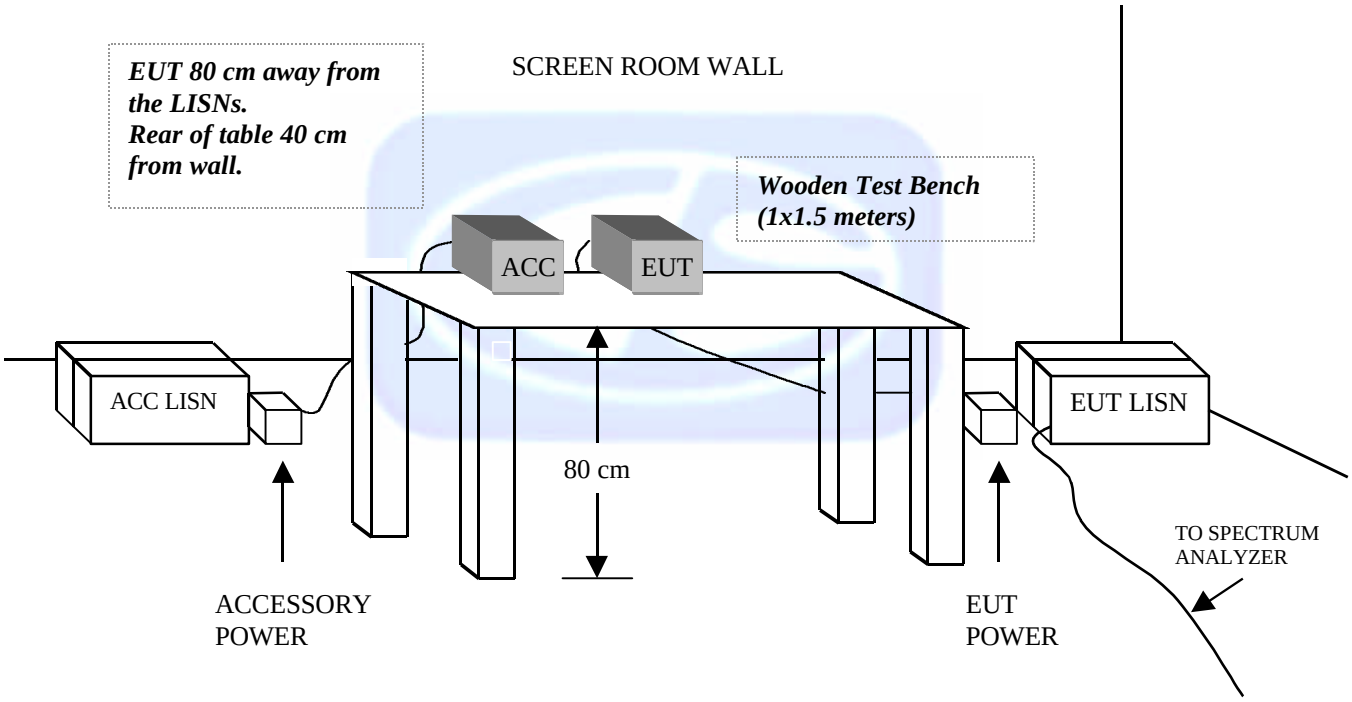
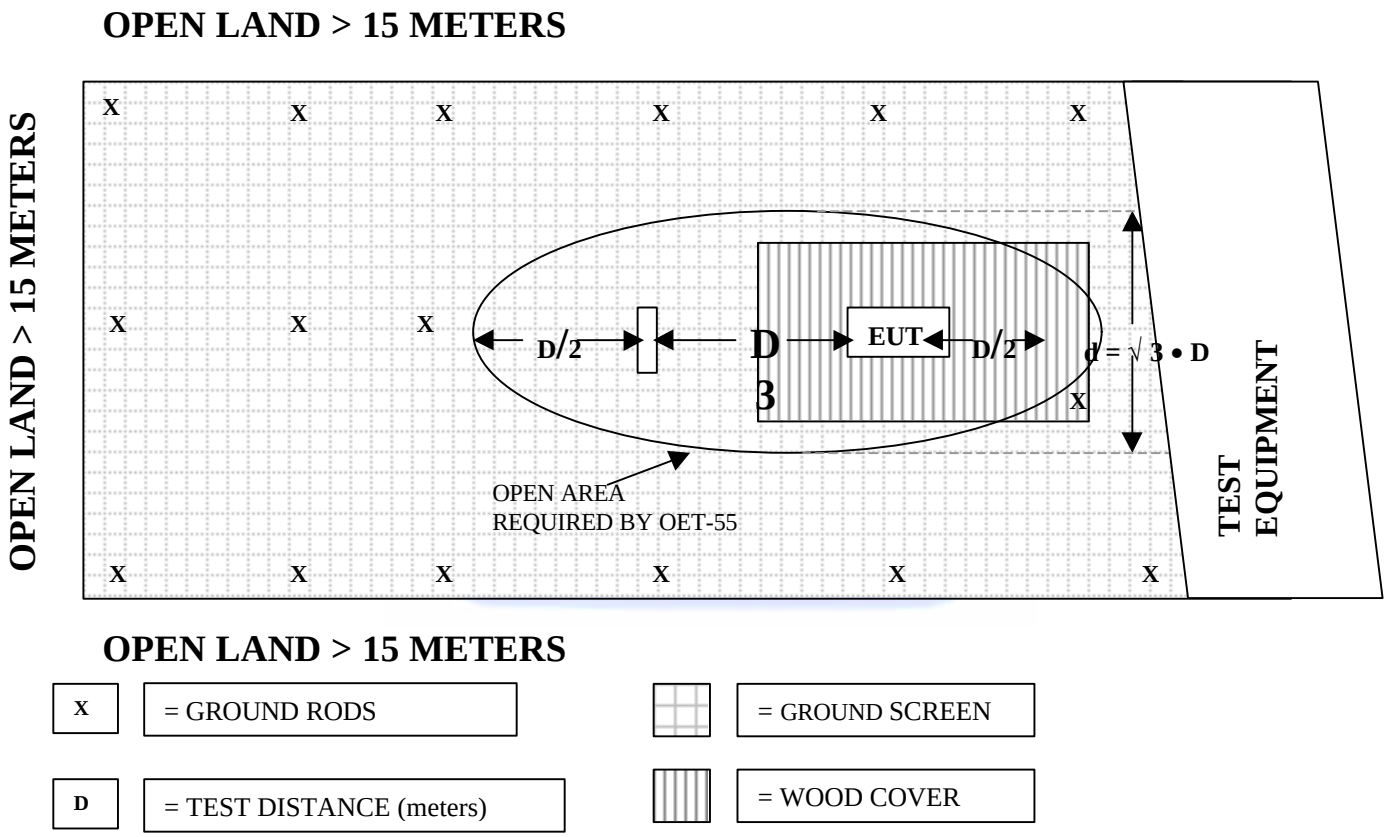
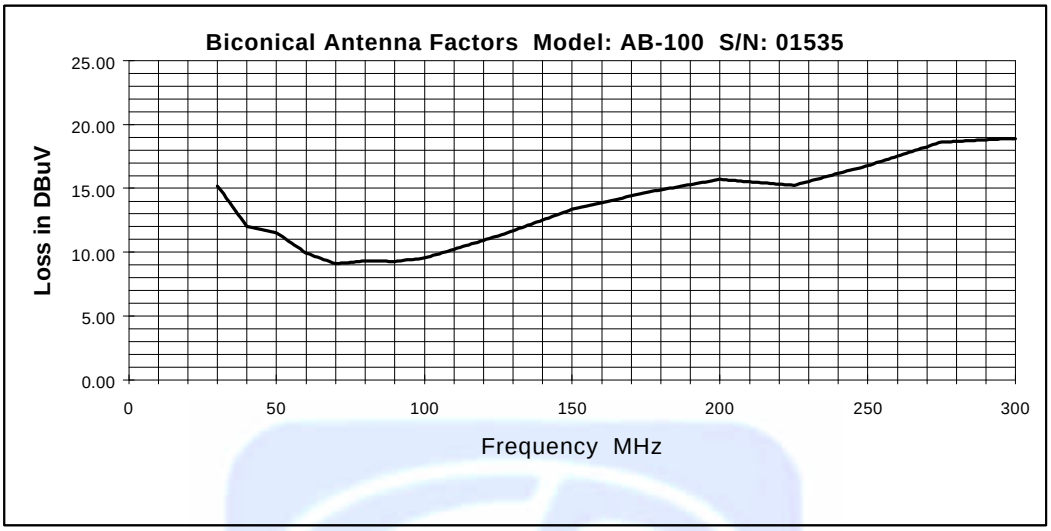
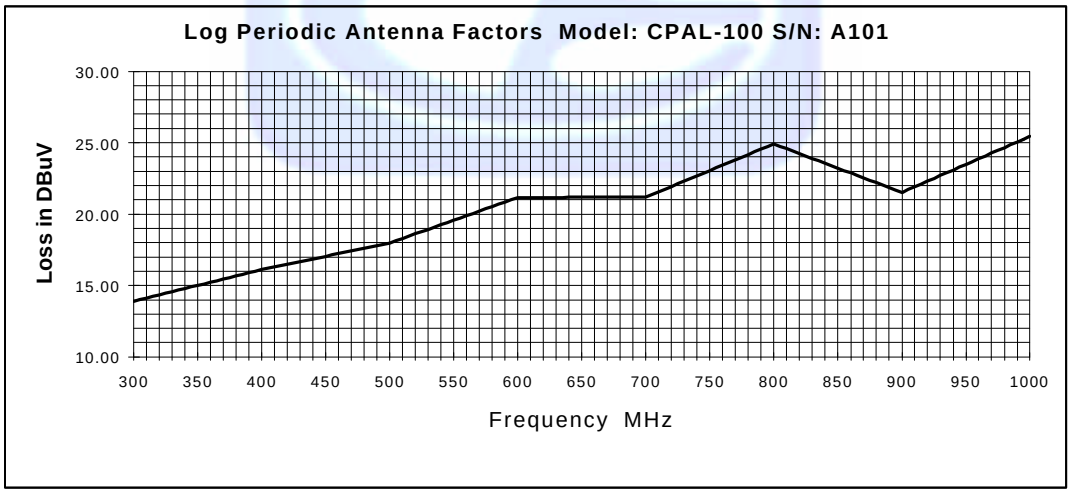
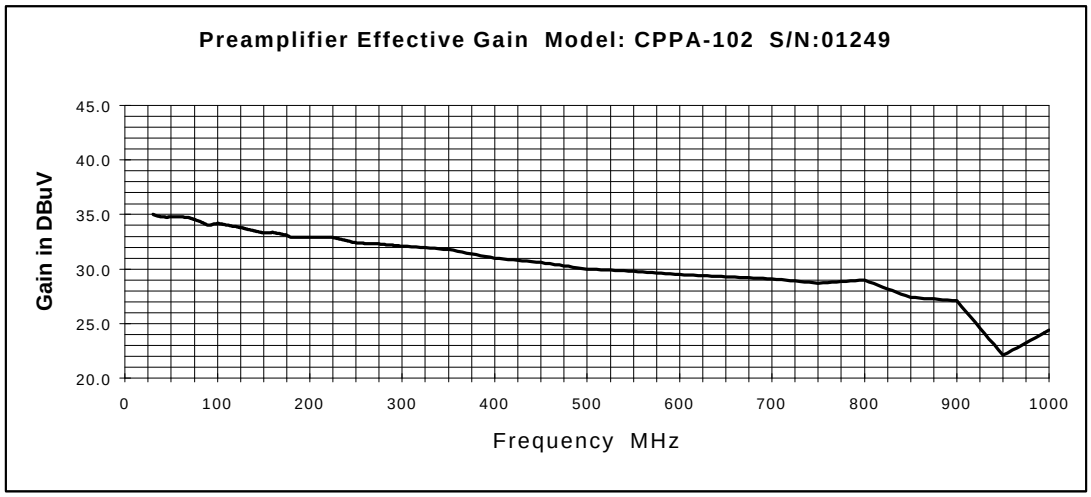


FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE




Biconical Antenna Factors Model: AB-100 S/N: 01535
Loss in DBuV
25.00
20.00
15.00
10.00
5.00
0.00
0
50
100
150
200
250
300
Frequency MHz


Log Periodic Antenna Factors Model: CPAL-100 S/N: A101
Loss in DBuV
30.00
25.00
20.00
15.00
10.00
300
350
400
450
500
550
600
650
700
750
800
850
900
950
1000
Frequency MHz


Preamplifier Effective Gain Model: CPPA-102 S/N:01249
Gain in DBuV
45.0
40.0
35.0
30.0
25.0
20.0
0
100
200
300
400
500
600
700
800
900
1000
Frequency MHz

Com-Power Corporation

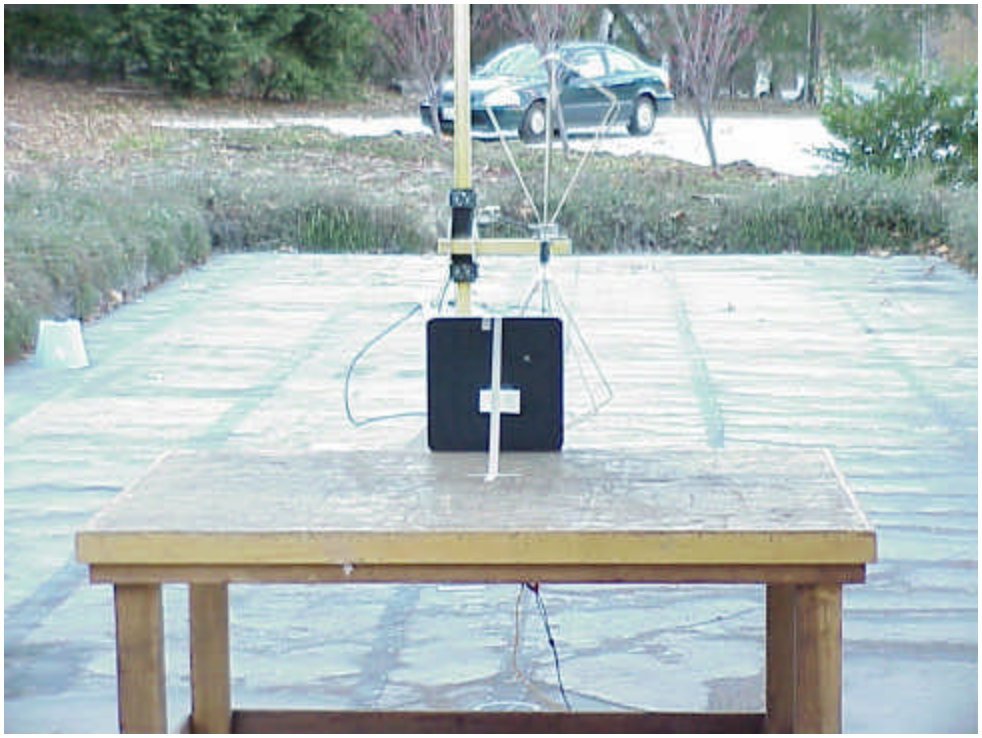
(949) 587-9800

Antenna Calibration

Antenna Type: Loop Antenna
Model: AL-130
Serial Number: 17054
Calibration Date: 3/30/00

Transmit Antenna Height: 2 meters
Receive Antenna Height: 2 meters

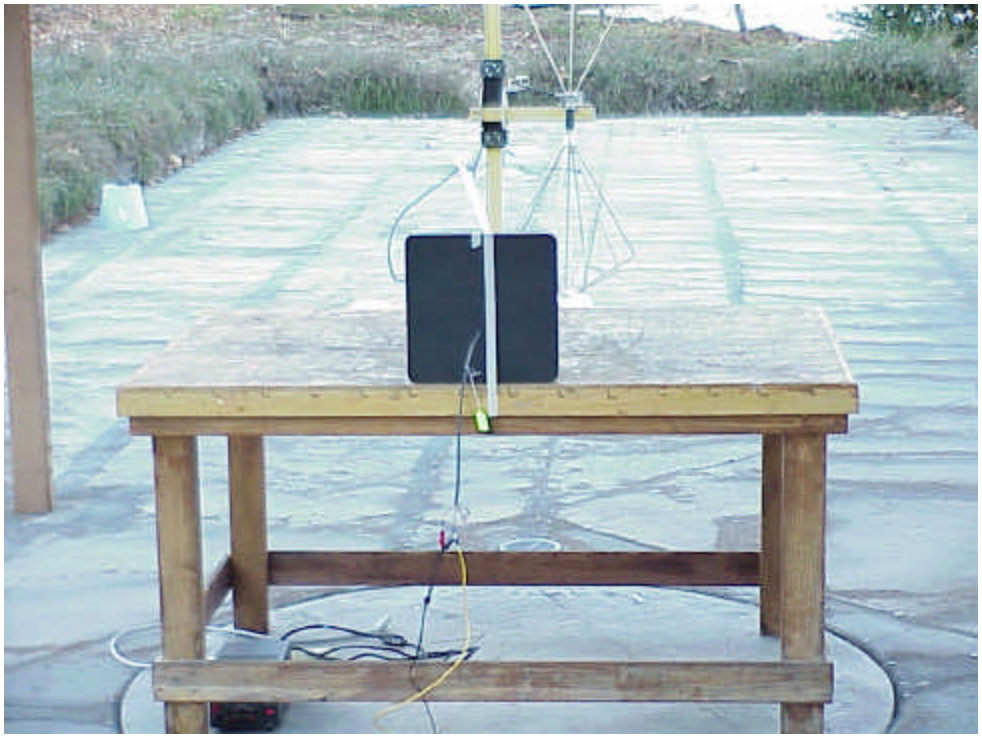
Frequency MHz	Magnetic (dB/m)	Electric (dB/m)
0.01	-41.3	10.2
0.02	-42.2	9.3
0.03	-40.5	11.0
0.04	-40.8	10.7
0.05	-42.1	9.4
0.06	-41.7	9.8
0.07	-41.8	9.7
0.08	-42.1	9.4
0.09	-42.3	9.2
0.1	-42.3	9.2
0.2	-44.6	6.9
0.3	-42.1	9.4
0.4	-42.2	9.3
0.5	-42.2	9.3
0.6	-42.1	9.4
0.7	-42.0	9.5
0.8	-42.0	9.5
0.9	-41.9	9.6
1	-41.4	10.1
2	-40.6	10.9
3	-40.9	10.6
4	-41.1	10.4
5	-40.5	11.0
6	-40.5	11.0
7	-40.9	10.6
8	-41.1	10.4
9	-40.6	10.9
10	-40.9	10.6
12	-41.6	9.9
14	-41.9	9.6
15	-42.1	9.4
16	-42.3	9.2
18	-42.1	9.4
20	-42.4	9.1
25	-43.4	8.1
30	-45.6	5.9



FRONT VIEW

SECURA KEY A DIVISION OF SOUNDCRAFT Inc.
ACCESS CONTROL SYSTEM
Model: RK-WL
FCC PART 15 SUBPART B & C - RADIATED EMISSIONS – 11-30-00

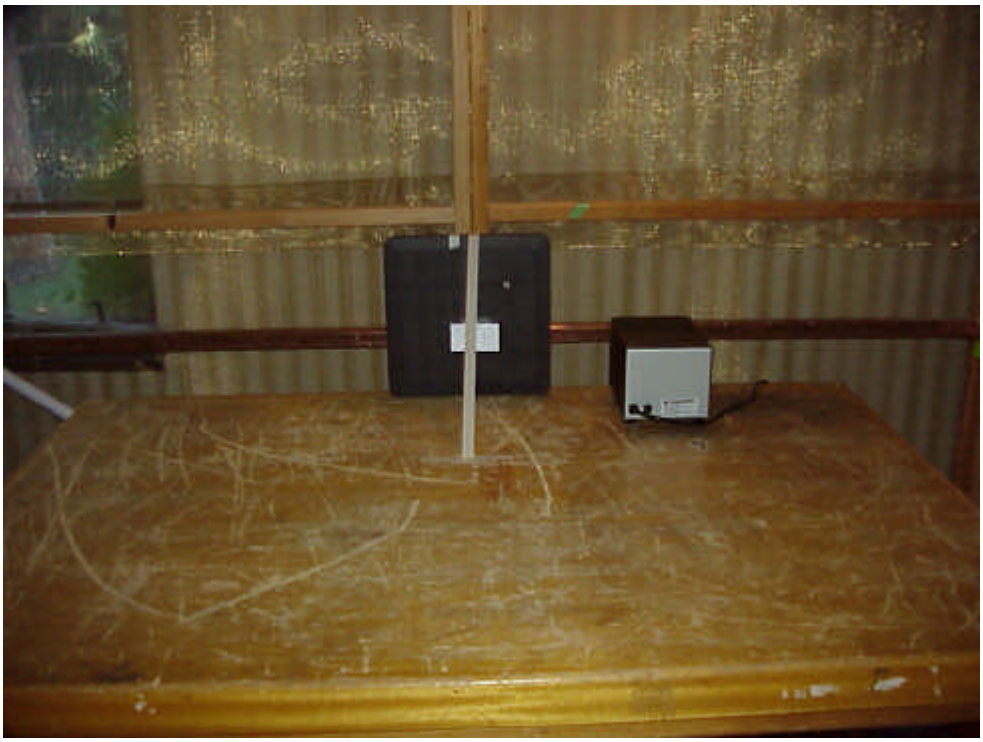
PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



BACK VIEW

SECURA KEY A DIVISION OF SOUNDCRAFT Inc.
ACCESS CONTROL SYSTEM
Model: RK-WL
FCC PART 15 SUBPART B & C - RADIATED EMISSIONS – 11-30-00

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



FRONT VIEW

SECURA KEY A DIVISION OF SOUNDCRAFT Inc.
ACCESS CONTROL SYSTEM
Model: RK-WL
FCC PART 15 SUBPART B & C - CONDUCTED EMISSIONS – 12-7-00

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

SECURA KEY A DIVISION OF SOUNDCRAFT Inc.
ACCESS CONTROL SYSTEM
Model: RK-WL
FCC PART 15 SUBPART B & C - CONDUCTED EMISSIONS – 12-7-00

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

APPENDIX E

DATA SHEETS

COMPATIBLE ELECTRONICS

Test location: Compatible Electronics
Customer : SECURA KEY
Manufacturer : SAME
EUT name : CARD READER (ACCESS CONTROL SYS.)
Specification: Fcc_B Test distance: 3.0 mtrs
Distance correction factor(20*log(test/spec)) : 0.00
Test Mode :
CLOCK: 16MHz
QUALIFICATION
TEMP:68 HUMID:60%
TEST ENG. A.KHAN

Date : 11/30/2000
Time : 13.49
Model: RK-WL
Lab: F

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	limit = L dBuV/m	Delta R-L dB
1V	32.01	44.50	1.86	14.55	36.52	24.39	40.00	-15.61
2V	40.03	47.50	1.50	12.03	36.60	24.43	40.00	-15.57
3V	48.01	51.60	1.76	11.63	36.68	28.31	40.00	-11.69
4V	56.03	52.20	1.74	10.56	36.70	27.80	40.00	-12.20
5V	64.03	52.60	1.70	9.59	36.70	27.19	40.00	-12.81
6V	72.03	50.30	1.72	9.14	36.66	24.50	40.00	-15.50
7V	80.04	57.30	1.80	9.32	36.50	31.92	40.00	-8.08
8V	96.02	51.70	1.96	9.44	36.42	26.68	43.50	-16.82
9V	104.03	47.70	2.02	9.82	36.47	23.07	43.50	-20.43
10V	108.02	47.40	2.03	10.10	36.44	23.09	43.50	-20.41
11V	112.02	44.70	2.05	10.38	36.40	20.72	43.50	-22.78
12V	132.05	42.80	2.18	11.86	36.27	20.58	43.50	-22.92
13V	144.03	45.60	2.33	12.86	36.22	24.56	43.50	-18.94
14V	160.03	52.00	2.40	13.88	36.16	32.12	43.50	-11.38
15V	176.04	39.10	2.44	14.71	36.10	20.15	43.50	-23.35
16V	240.02	39.50	2.88	16.17	35.98	22.57	46.00	-23.43
17V	279.91	43.40	3.22	18.69	36.08	29.23	46.00	-16.77
18H	32.00	39.20	1.86	14.56	36.52	19.10	40.00	-20.90
19H	39.99	40.60	1.50	12.03	36.60	17.53	40.00	-22.47
20H	48.02	46.10	1.76	11.63	36.68	22.81	40.00	-17.19
21H	56.03	44.80	1.74	10.56	36.70	20.40	40.00	-19.60
22H	72.02	49.50	1.72	9.14	36.66	23.70	40.00	-16.30
23H	79.99	50.70	1.80	9.32	36.50	25.32	40.00	-14.68
24H	96.02	50.70	1.96	9.44	36.42	25.68	43.50	-17.82
25H	107.99	44.00	2.03	10.10	36.44	19.69	43.50	-23.81
26H	111.99	45.90	2.05	10.37	36.40	21.92	43.50	-21.58
27H	131.98	41.10	2.18	11.86	36.27	18.87	43.50	-24.63
28H	144.06	46.00	2.33	12.86	36.22	24.96	43.50	-18.54
29H	160.04	47.60	2.40	13.88	36.16	27.72	43.50	-15.78
30H	176.04	38.20	2.44	14.71	36.10	19.25	43.50	-24.25

Test location: Compatible Electronics
Customer : SECURA KEY
Manufacturer : SAME
EUT name : CARD READER (ACCESS CONTROL SYS.)
Specification: Fcc_B Test distance: 3.0 mtrs
Distance correction factor(20*log(test/spec)) : 0.00
Test Mode :
CLOCK: 16MHz
QUALIFICATION
TEMP: 68 HUMID: 60%
TEST ENG. A.KHAN

Date : 11/30/2000
Time : 13.49
Model: RK-WL
Lab: F

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	limit = L dBuV/m	Delta R-L dB
31H	240.01	42.30	2.88	16.16	35.98	25.36	46.00	-20.64
32H	288.02	37.90	3.25	18.78	36.05	23.89	46.00	-22.11
33V	336.04	39.30	3.52	15.60	36.07	22.34	46.00	-23.66
34V	431.98	39.70	4.18	16.71	35.86	24.73	46.00	-21.27
35V	559.98	33.50	4.74	19.89	35.50	22.63	46.00	-23.37
36H	320.02	41.00	3.42	15.47	36.04	23.85	46.00	-22.15
37H	336.06	39.30	3.52	15.60	36.07	22.34	46.00	-23.66
38H	432.07	43.50	4.18	16.71	35.86	28.53	46.00	-17.47

COMPATIBLE ELECTRONICS

12/07/2000 14:38:14

SECURA KEY
CARD READER
RK-WL BK PERCISION PS 110V Line

TEST ENGINEER : A. Khan
A.KHAN

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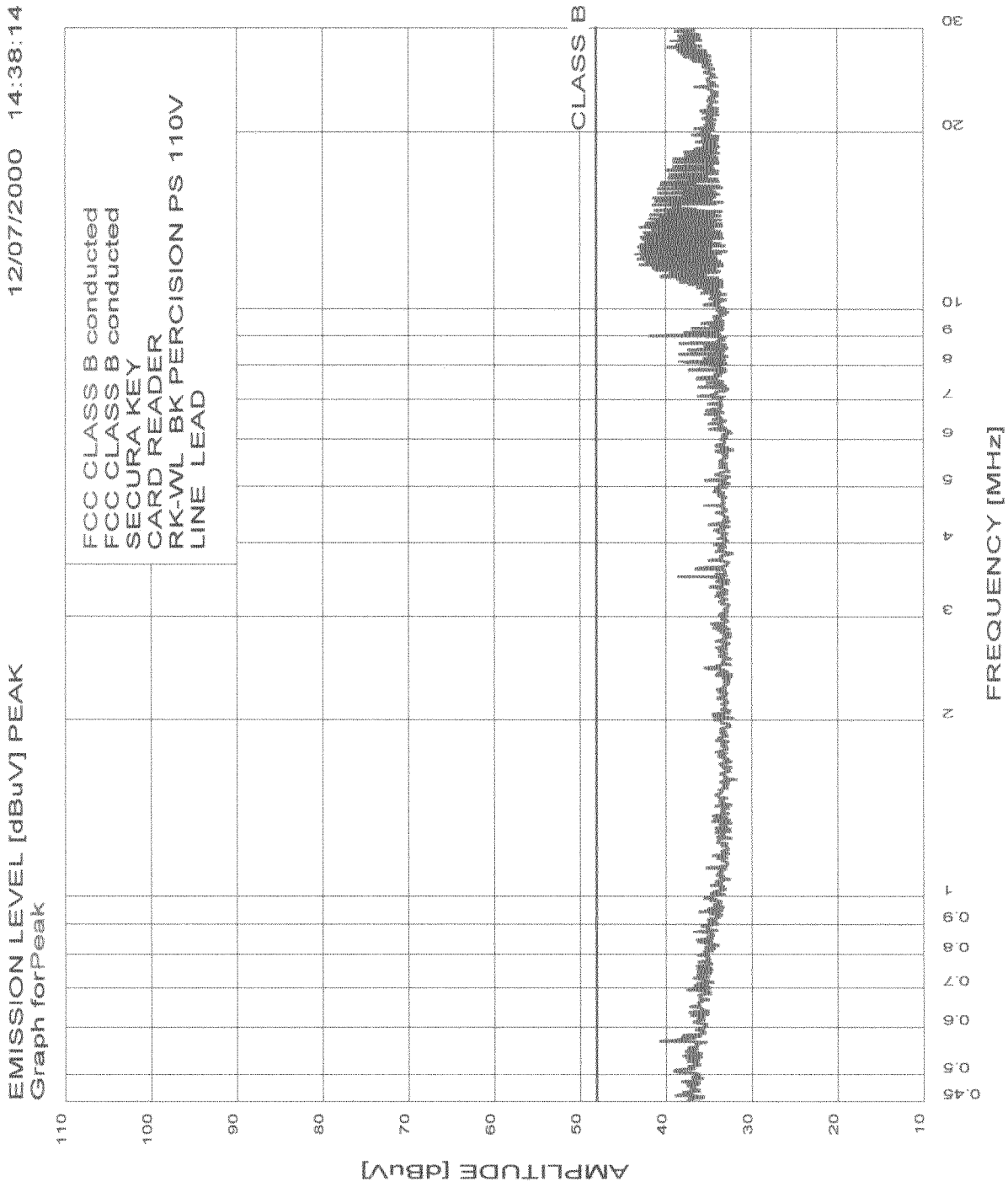
7 highest peaks above -50.00 dB of CLASS B limit line
Peak criteria : 3.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV	Limit(dB)	Delta(dB)
1	12.378	43.44	48.00	-4.56
2	12.117	43.13	48.00	-4.87
3	12.743	43.06	48.00	-4.94
4	13.747	42.92	48.00	-5.08
5	11.861	42.91	48.00	-5.09
6	12.848	42.87	48.00	-5.13
7	0.450	37.47	48.00	-10.53


EMISSION LEVEL [dBuV] PEAK
Graph forPeak
12/07/2000 14:38:14
FCC CLASS B conducted
FCC CLASS B conducted
SECURA KEY
CARD READER
RK-WL BK PERCISION PS 110V
LINE LEAD
CLASS B
AMPLITUDE [dBuV]
FREQUENCY [MHz]
110
100
90
80
70
60
50
40
30
20
10
0.45
0.5
0.6
0.7
0.8
0.9
1
2
3
4
5
6
7
8
9
10
20
30

COMPATIBLE ELECTRONICS

12/07/2000 14:48:32

SECURA KEY
CARD READER
RK-WL BK PERCISION PS 110V Neutral

TEST ENGINEER : A. Khan
A.KHAN

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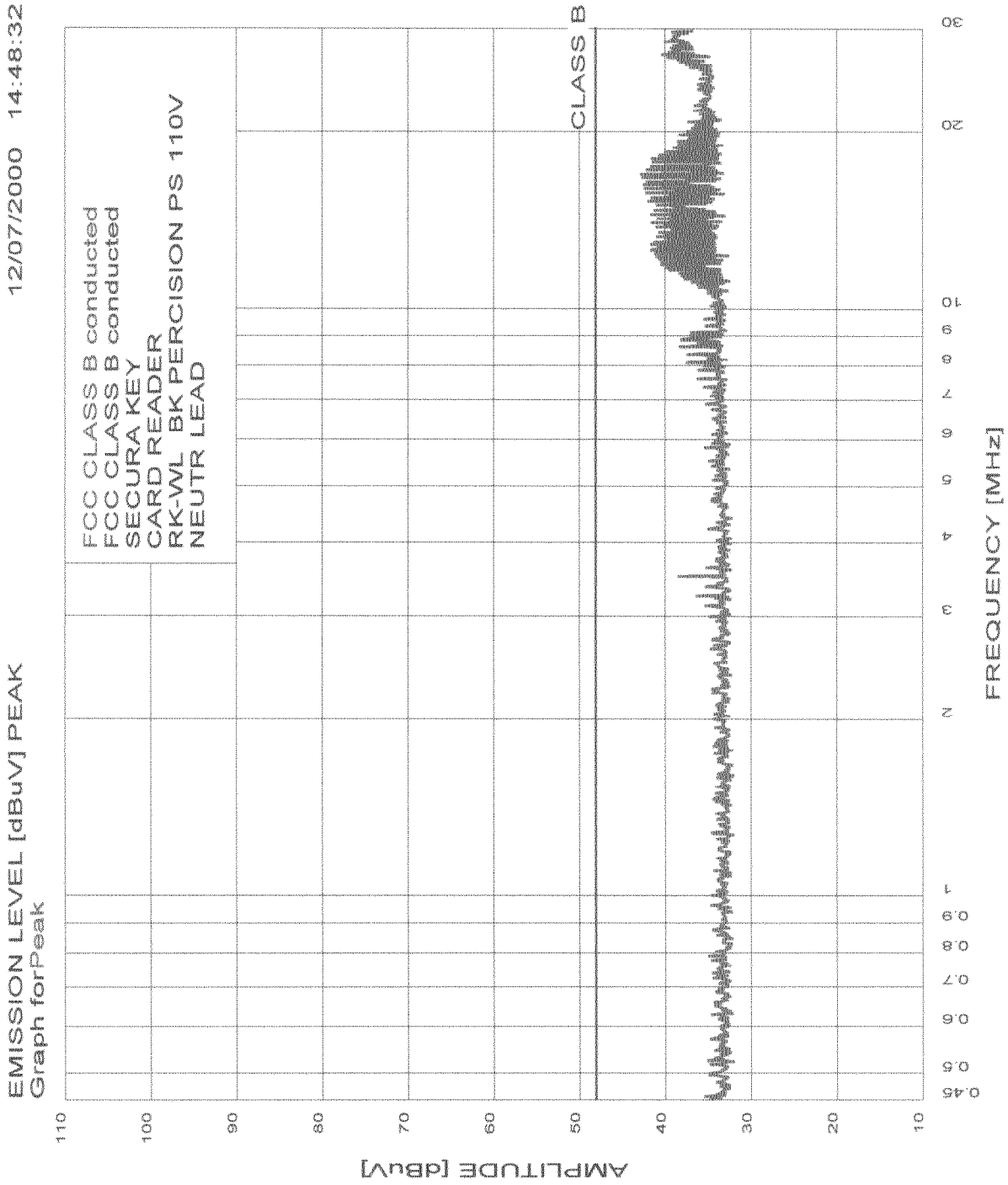
7 highest peaks above -50.00 dB of CLASS B limit line
Peak criteria : 3.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	16.956	42.73	48.00	-5.27
2	16.737	42.52	48.00	-5.48
3	16.261	42.40	48.00	-5.60
4	15.993	42.29	48.00	-5.71
5	15.724	42.07	48.00	-5.93
6	17.248	42.04	48.00	-5.96
7	0.450	34.74	48.00	-13.26


EMISSION LEVEL [dBuV] PEAK
Graph forPeak
12/07/2000 14:48:32
FCC CLASS B conducted
FCC CLASS B conducted
SECURA KEY
CARD READER
RK-WL BK PERCISION PS 110V
NEUTR LEAD
CLASS B
AMPLITUDE [dBuV]
110
100
90
80
70
60
50
40
30
20
10
FREQUENCY [MHz]
0.45
0.5
0.6
0.7
0.8
0.9
1
2
3
4
5
6
7
8
9
10
20
30

RADIATED EMISSIONS

COMPANY NAME: Secure Key **DATE:** 11-30-00

EUT: Card Reader (Access Control Sys **EUT S/N:**

EUT MODEL: RK-WL **LOCATION:** ☐ BREA ☐ SILVERADO ☑ AGOURA

SPECIFICATION: FCC **CLASS:** B **TEST DISTANCE:** 3M **LAB:** F

ANTENNA: ☑ LOOP ☐ BICONICAL ☐ LOG ☐ HORN **POLARIZATION:** ☐ VERT ☐ HORIZ

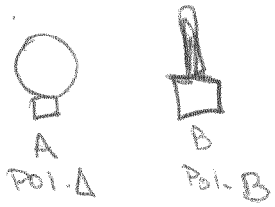
☑ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT **ENGINEER:** A. Khan

NOTES: 60 Log EUT was tested to 1.25MHz Limit 135.97 = 125KHz

3M 125KHz = 119.6dBuV

10M 125KHz = 90.6dBuV

29dBuV



Frequency KHz ~~(MHz)~~	Peak Reading (dBuV/m)	Quasi-Peak (dBuV/m)	Antenna Height (meters)	Azimuth (degrees)	Delta * (dB)	Corrected Limit (dBuV/m)	Comments Pol. A
125KHz	83.3		1M	90°	-52.67	135.97	Pol. A
250KHz	39.3		1M	90°	-93.45	132.75	Pol. A
375KHz	39.4		1M	90°	-87.32	126.72	Pol. A
500KHz	42.4		1M	90°	-83.81	126.21	Pol. A
625KHz	43.1		1M	90°	-80.72	123.82	Pol. A
125KHz	74.7		1M	90°	-61.27	135.97	Pol. B
250KHz	31.7		1M	90°	-101.05	132.75	Noise floor
375KHz	32.5		1M	90°	-94.22	126.72	Noise floor
500KHz	32.1		1M	90°	-94.11	126.21	Noise floor
625KHz	31.9		1M	90°	-91.92	123.82	Noise floor

* DELTA = METER READING - CORRECTED LIMIT