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EMC/SAFETY

ADEMCO OMNITEK TEST REPORT

FOR THE

OMNISMART OS30 CONTACTLESS SMART CARD RFID READER

FCC PART 15 SUBPART C SECTIONS 15.225, 15.207 & 15.209

COMPLIANCE

DATE OF ISSUE: MARCH 27, 2003

PREPARED FOR:

ADEMCO OmniTek
149 Eileen Way
Syosset, NY 11791

W.O. No.: 80252

PREPARED BY:

Mary Ellen Clayton
CKC Laboratories, Inc.
5473A Clouds Rest
Mariposa, CA 95338

Date of test: March 10-27, 2003

Report No.: FC03-020

TABLE OF CONTENTS

ADMINISTRATIVE INFORMATION

DATE OF TEST:	March 10-27, 2003
DATE OF RECEIPT:	March 10, 2003
PURPOSE OF TEST:	To demonstrate the compliance of the OmniSmart OS30 Contactless Smart Card RFID Reader with the requirements for FCC Part 15 Subpart C Sections 15.225, 15.207 and 15.209 devices.
TEST METHOD:	ANSI C63.4 (1992)
MANUFACTURER:	ADEMCO OmniTek 149 Eileen Way Syosset, NY 11791
REPRESENTATIVE:	Adel Hamza
TEST LOCATION:	CKC Laboratories, Inc. 110 Olinda Place Brea, CA 92621

SUMMARY OF RESULTS

As received, the ADEMCO OmniTek OmniSmart OS30 Contactless Smart Card RFID Reader was found to be fully compliant with the following standards and specifications:

United States

- FCC Part 15 Subpart C Sections 15.225, 15.207 & 15.209
- ANSI C63.4 (1992) method

CONDITIONS FOR COMPLIANCE

No modifications to the EUT were necessary to comply.

APPROVALS

QUALITY ASSURANCE:

Steve Behm, Director of Engineering Services and Quality Assurance

Joyce Walker, Quality Assurance Administrative Manager

TEST PERSONNEL:

Septimiu Apahidean, Lab Manager

Stuart Yamamoto, EMC Engineer

EQUIPMENT UNDER TEST (EUT) DESCRIPTION
The OmniSmart OS30 Contactless Smart Card RFID Reader tested by CKC Laboratories was a production unit.

15.31(e) Voltage Variations

Voltage Variations (±15%)

		Channel 1 (MHz)	Dev. (MHz)
Channel Frequency:		13.56	
Temp (C)	Voltage		
20	4.6	13.56073	0.00073
20	5.4	13.56079	0.00079
20	6.2	13.56074	0.00074

Max Deviation (MHz)	**0.00082**
Max Deviation (%)	**0.00006**
	PASS

15.31(m) Number Of Channels
This device operates on a single channel.

15.33(a) Frequency Ranges Tested
15.207 Conducted: 150 kHz – 30 MHz
15.225/15.209 Radiated: 9 kHz – 1 GHz

15.35:
TABLE B: ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE

TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz

15.203 Antenna Requirements
The antenna is an integral part of the EUT and is non-removable; therefore the EUT complies with Section 15.203 of the FCC rules.

15.205 Restricted Bands
The fundamental operating frequency lies outside the restricted bands and therefore complies with the requirements of Section 15.205 of the FCC rules. Any spurious emission coming from the EUT was investigated to determine if any portion lies inside the restricted band. If any portion of a spurious emissions signal was found to be within a restricted band, investigation was performed to ensure compliance with Section 15.209.

Eut Operating Frequency
The EUT was operating at 13.56 MHz.

Temperature And Humidity During Testing
The temperature during testing was within +15°C and + 35°C.
The relative humidity was between 20% and 75%.

EQUIPMENT UNDER TEST

Magnetic Card Reader

Manuf:	ADEMCO OmniTek
Model:	OmniSmart OS30 Contactless Smart Card RFID Reader
Serial:	0251
FCC ID:	QGAOMNISMART(pending)

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

DC Power Supply

Manuf:	Topward
Model:	6306D
Serial:	988614
FCC ID:	NA

DC Power Supply

Manuf:	Sprint
Model:	ASC-200
Serial:	NA
FCC ID:	NA

REPORT OF MEASUREMENTS

The following tables report the worst case emissions levels recorded during the tests performed on the OmniSmart OS30 Contactless Smart Card RFID Reader. All readings taken were peak readings unless otherwise stated. The data sheets from which the emissions tables were compiled are contained in Appendix C.

Table 1: 15.207 Six Highest Conducted Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Lisn dB		Cable dB		CORRECTED READING dBµV	SPEC LIMIT dBµV	MARGIN dB	NOTES
0.150000	45.5	0.0		0.1		45.6	56.0	-10.4	B
0.156545	45.1	0.0		0.1		45.2	55.6	-10.4	W
0.655404	37.8	0.0		0.1		37.9	46.0	-8.1	B
0.858293	33.2	0.0		0.1		33.3	46.0	-12.7	B
13.574480	45.2	0.0		0.3		45.5	50.0	-4.5	BA
13.575410	40.2	0.0		0.3		40.5	50.0	-9.5	WA

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Section 15.207

NOTES: A = Average Reading
B = Black Lead
W = White Lead

COMMENTS: The EUT is stand alone on the tabletop. The AC to DC power adapter is plugged into the LISN and supplies 9VDC to the EUT. The EUT transmits at 13.56 MHz. The EUT is in continuous read mode. Temperature: 21°C, Humidity: 44%, Humidity: 100kPa.

Table 2: 15.225(a) Fundamental Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	Dist dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
13.560	45.5	10.2		0.8	-19.0	37.5	80.0	-42.5	N

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Section 15.225(a)
Test Distance: 10 Meters

NOTES: N = No Polarization

COMMENTS: The EUT is stand alone on the tabletop. A DC power supply rests underneath the table and supplies the 5.4 VDC to power the EUT. The EUT transmits at 13.56 MHz. The EUT is in continuous read mode. Temperature: 19°C, Humidity: 47%, Humidity: 100kPa. Frequency range tested: 13.56 MHz.

Table 3: 15.225(b)/15.209 Six Highest Radiated Emission Levels

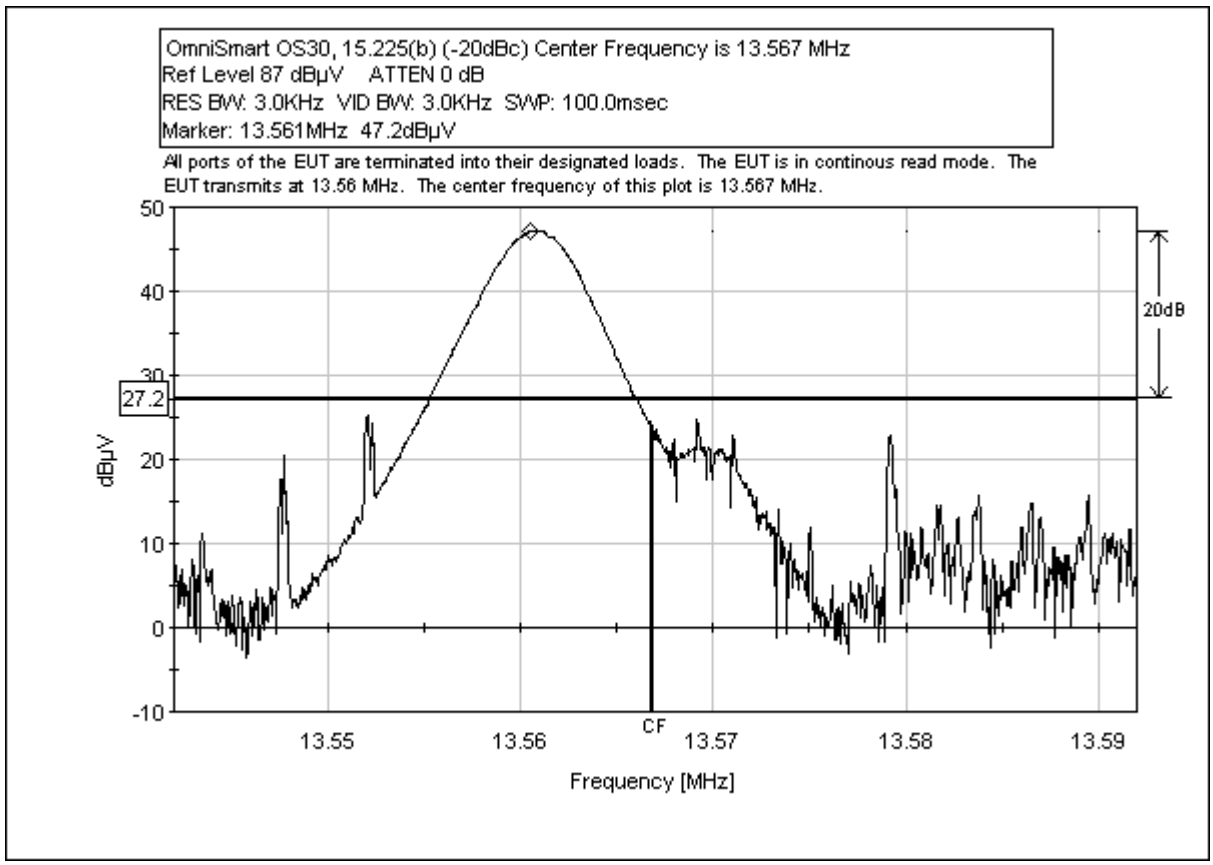
FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
27.121	15.5	8.8	0.0	1.1		25.4	29.5	-4.1	N
94.976	46.6	9.7	-27.1	2.3		31.5	43.5	-12.0	V
271.253	45.7	13.0	-26.8	4.1		36.0	46.0	-10.0	V
935.738	32.0	23.3	-26.1	8.2		37.4	46.0	-8.6	V
942.264	28.9	23.4	-26.1	8.3		34.5	46.0	-11.5	V
949.315	30.3	23.5	-26.1	8.3		36.0	46.0	-10.0	V

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Sections 15.225(b)
Test Distance: 3 Meters

NOTES: N = No Polarization
V = Vertical Polarization

COMMENTS: The EUT is stand alone on the tabletop. A DC power supply rests underneath the table and supplies the 5.4 VDC to power the EUT. The EUT transmits at 13.56 MHz. The EUT is in continuous read mode. Temperature: 19°C, Humidity: 47%, Humidity: 100kPa. Frequency range tested: 9 kHz to 1 GHz.

15.215/15.225(b) BANDEDGE COMPLIANCE



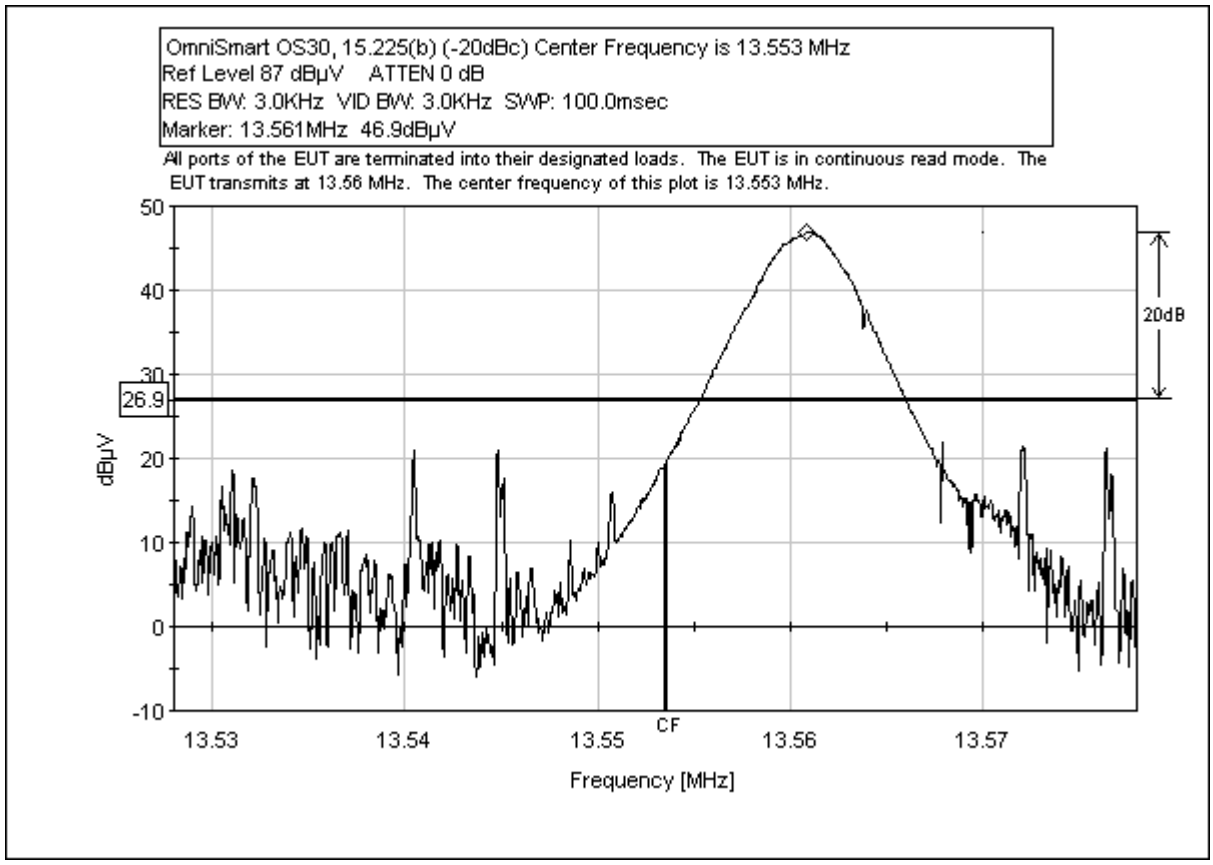

OmniSmart OS30, 15.225(b) (-20dBc) Center Frequency is 13.553 MHz
Ref Level 87 dBµV ATTEN 0 dB
RES BW: 3.0KHz VID BW: 3.0KHz SWP: 100.0msec
Marker: 13.561MHz 46.9dBµV
All ports of the EUT are terminated into their designated loads. The EUT is in continuous read mode. The EUT transmits at 13.56 MHz. The center frequency of this plot is 13.553 MHz.
50
40
30
26.9
20
10
0
-10
dBµV
20dB
CF
13.53
13.54
13.55
13.56
13.57
Frequency [MHz]

Table 4: 15.225(c) Frequency Stability

Device Model #: OmniSmart OS30
Operating Voltage: 5.4 **VDC**
Frequency Limit: 0.01 **%**

Temperature Variations

Channel Frequency:		**Channel 1 (MHz)** **13.56**	**Dev. (MHz)**
Temp (C)	Voltage		
-20	5.4	13.5608135	0.00081
-10	5.4	13.5608190	0.00082
0	5.4	13.5608040	0.00080
10	5.4	13.5607800	0.00078
20	5.4	13.5607290	0.00073
30	5.4	13.5607480	0.00075
40	5.4	13.5607000	0.00070
50	5.4	13.5606730	0.00067

MEASUREMENT UNCERTAINTY

TEST	HIGHEST UNCERTAINTY
Radiated Emissions	+/- 2.94 dB
Conducted Emissions	+/- 1.56 dB

Note: Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. Statements of compliance are based on the nominal values only.

EUT SETUP

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the photographs in Appendix A. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables. The corrected data was then compared to the applicable emission limits to determine compliance.

The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available I/O ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. I/O cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected. All excessive interconnecting cable was bundled in 30-40 centimeter lengths.

The radiated and conducted emissions data of the Magnetic Card Reader, OmniSmart OS30, was taken with the HP Spectrum Analyzer. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in Table A.

Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula in Table A. This reading was then compared to the applicable specification limit to determine compliance.

TABLE A: SAMPLE CALCULATIONS		
	Meter reading	(dBµV)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed in Appendix B were used to collect both the radiated and conducted emissions data. For radiated measurements from 9 kHz to 30 MHz, the magnetic loop antenna was used. For frequencies from 30 to 1000 MHz, the biconilog antenna was used. The horn antenna was used for frequencies above 1000 MHz. Conducted emissions tests required the use of the FCC type LISNs.

The HP spectrum analyzer was used for all measurements. Table B shows the analyzer bandwidth settings that were used in designated frequency bands. For conducted emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used. A 10 dB external attenuator was also used during conducted tests, with internal offset correction in the analyzer. During radiated testing, the measurements were made with 0 dB of attenuation, a reference level of 97 dBµV, and a vertical scale of 10 dB per division.

SPECTRUM ANALYZER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the Tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "Peak" mode. Whenever a "Quasi-Peak" or "Average" reading is listed as one of the six highest readings, this is indicated as a "Q" or an "A" in the appropriate table. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the Spectrum Analyzer or test engineer recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the analyzer called "peak hold," the analyzer had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the analyzer made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the HP Quasi-Peak Adapter for the HP Spectrum Analyzer. The detailed procedure for making quasi peak measurements contained in the HP Quasi-Peak Adapter manual were followed.

Average

For certain frequencies, average measurements may be made using the spectrum analyzer. To make these measurements, the test engineer reduces the video bandwidth on the analyzer until the modulation of the signal is filtered out. At this point the analyzer is set into the linear mode and the scan time is reduced.

EUT TESTING

Mains Conducted Emissions

During conducted emissions testing, the EUT was located on a wooden table measuring approximately 80 cm high, 1 meter deep, and 1.5 meters in length. One wall of the room where the EUT was located has a minimum 2 meter by 2 meter conductive plane. The EUT was mounted on the wooden table 40 cm away from the conductive plane, and 80 cm from any other conductive surface.

The vertical metal plane used for conducted emissions was grounded to the earth. Power to the EUT was provided through a LISN. The LISN was grounded to the ground plane. All other objects were kept a minimum of 80 cm away from the EUT during the conducted test.

The LISNs used were 50 µH-/+50 ohms. Above 150 kHz, a 0.15 µF series capacitor was added in-line prior to connecting the analyzer to restore the proper impedance for the range. A 30 to 50 second sweep time was used for automated measurements in the frequency bands of 150 kHz to 500 kHz, and 500 kHz to 30 MHz. All readings within 20 dB of the limit were recorded, and those within 6 dB of the limit were examined with additional measurements using a slower sweep time.

Radiated Emissions

The EUT was mounted on a nonconductive, rotating table 80 cm above the conductive grid. The nonconductive table dimensions were 1 meter by 1.5 meters.

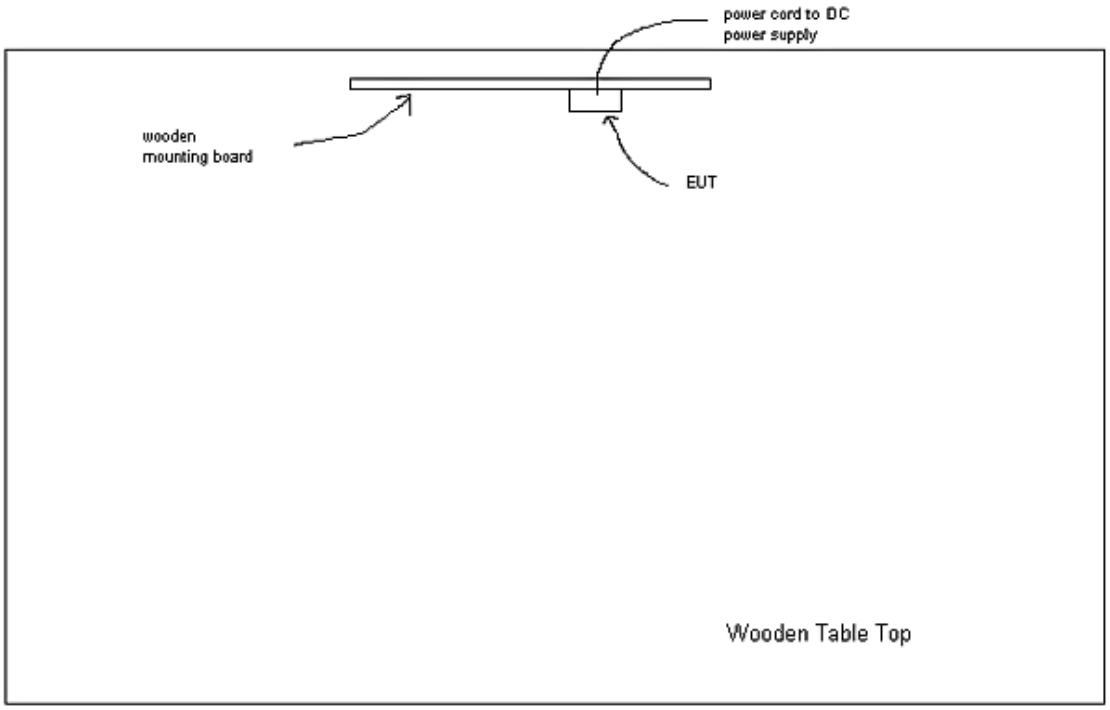
During the preliminary radiated scan, the EUT was powered up and operating in its defined FCC test mode. For radiated measurements from 9 kHz to 30 MHz, the magnetic loop antenna was used. The frequency range of 30 MHz to 1000 MHz was scanned with the biconilog antenna located about 1.5 meter above the ground plane in the vertical polarity. During this scan, the turntable was rotated and all peaks at or near the limit were recorded. A scan of the FM band from 88 to 110 MHz was then made using a reduced resolution bandwidth and frequency span. The biconilog antenna was changed to the horizontal polarity and the above steps were repeated. Care was taken to ensure that no frequencies were missed within the FM and TV bands. An analysis was performed to determine if the signals that were at or near the limit were caused by an ambient transmission. If unable to determine by analysis, the equipment was powered down to make the final determination if the EUT was the source of the emission.

A thorough scan of all frequencies was made manually using a small frequency span, rotating the turntable as needed. The test engineer maximized the readings with respect to the table rotation, antenna height, and configuration of EUT. Maximizing of the EUT was achieved by monitoring the spectrum analyzer on a closed circuit television monitor.

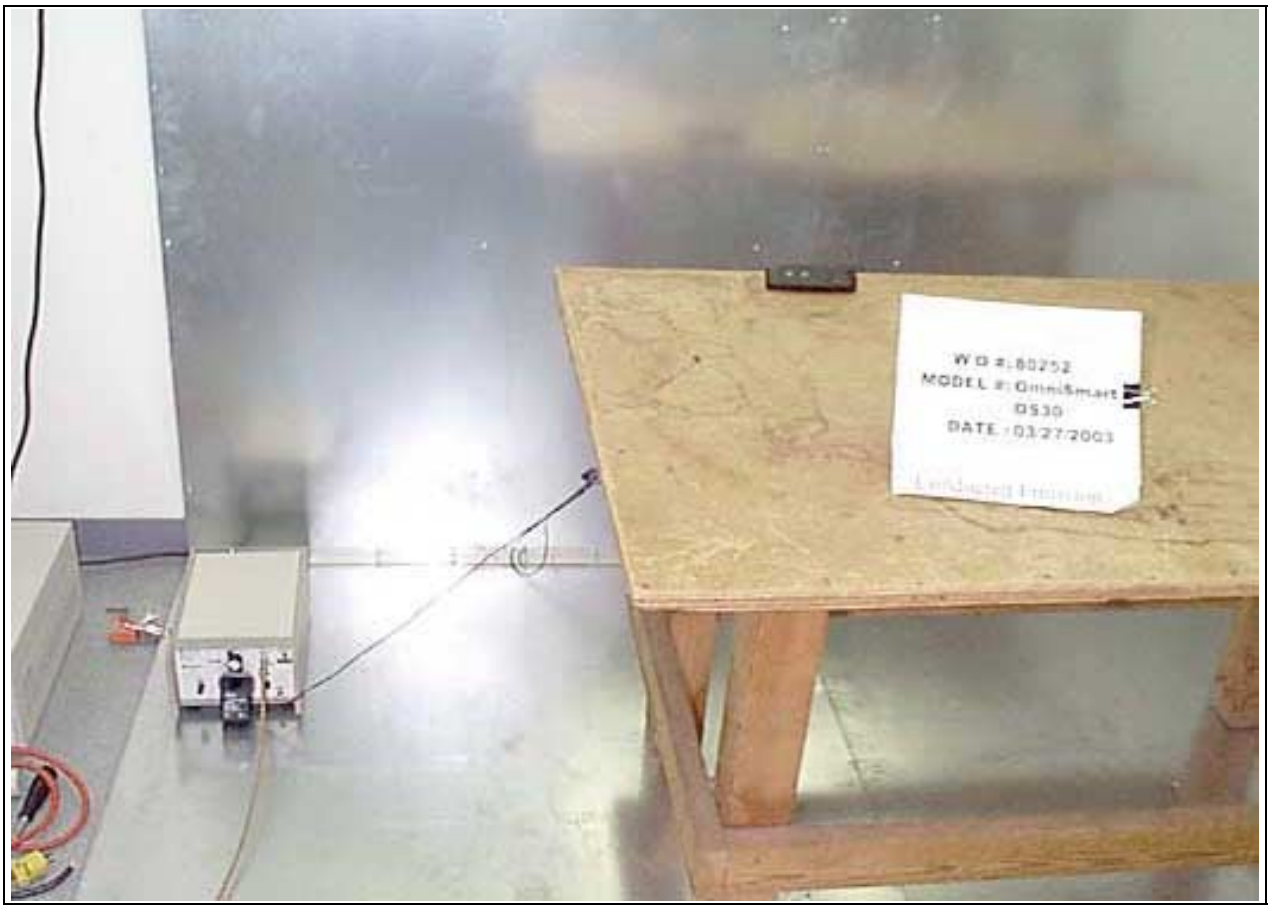
APPENDIX A

TEST SETUP DIAGRAM AND PHOTOGRAPHS

DIAGRAM SHOWING OATS SETUP



15.207

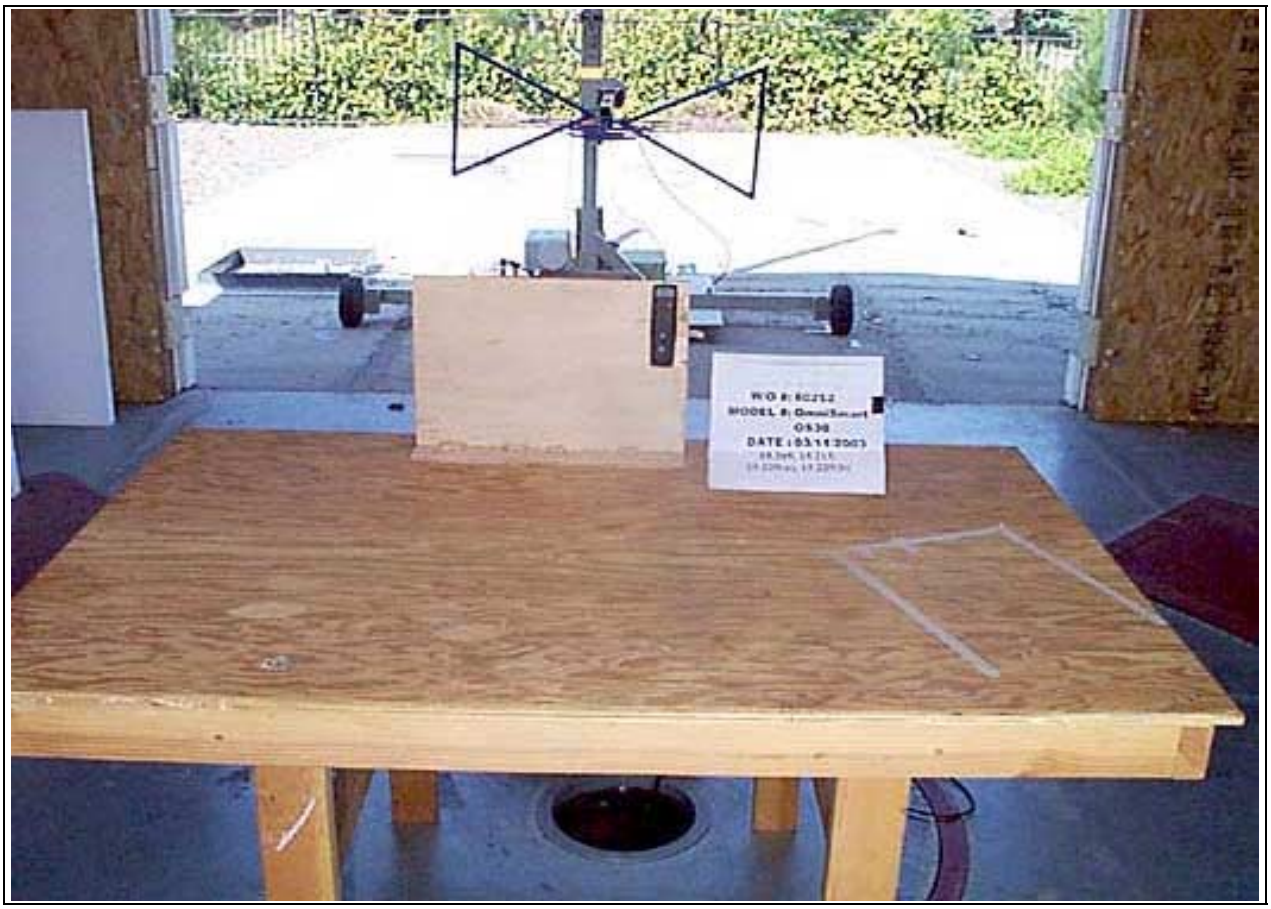


15.207 Front View

15.207

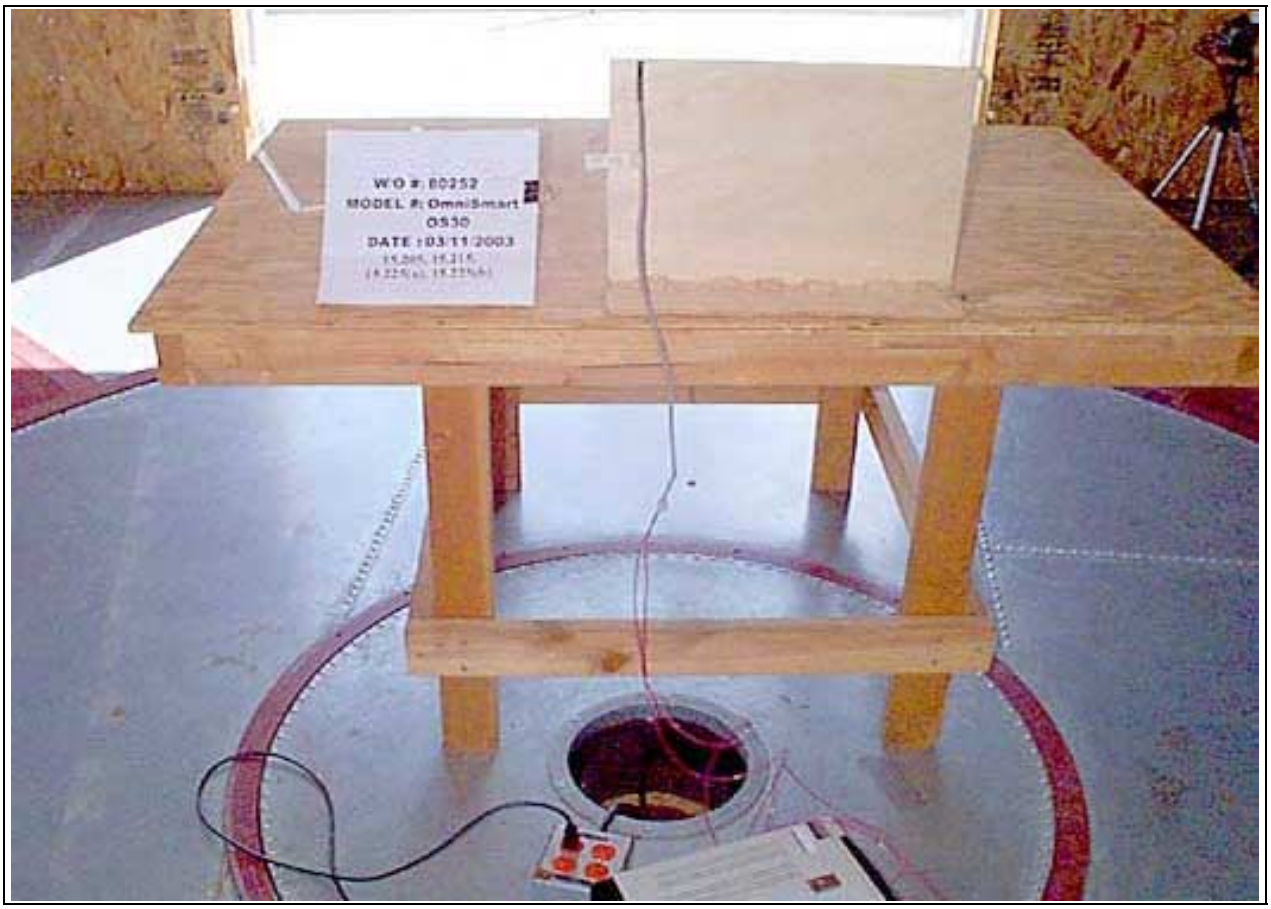
15.207 Back View

15.209, 15.215 & 15.225



15.209, 15.215 & 15.225 Front View

15.209, 15.215 & 15.225



15.209, 15.215 & 15.225 Back View

APPENDIX B

TEST EQUIPMENT LIST

15.207

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer (Site D)	02554	HP	8566B	2746A06369	052102	052103
QP Adapter (Site D)	00311	HP	85650A	2430A00532	061402	061403
LISN	00848	EMCO	3816/2	1102	010403	010404

15.215, 15.225(a) and 15.225(b)(-20dBc)

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer (Site D)	02554	HP	8566B	2746A06369	052102	052103
QP Adapter (Site D)	00311	HP	85650A	2430A00532	061402	061403
Magnetic Loop Antenna	00314	Emco	6502	2014	072302	072303
Antenna cable from bulkhead to antenna	N/A	Belden	9268	Cable #6	050602	050603
Antenna cable (10 meter site D)	NA	Andrew	LDF1-50	Cable#17	091102	091103

15.209 and 15.225(b)(Spurious)

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer (Site D)	02554	HP	8566B	2746A06369	052102	052103
QP Adapter (Site D)	00311	HP	85650A	2430A00532	061402	061403
Magnetic Loop Antenna	00314	Emco	6502	2014	072302	072303
Bilog Antenna	00851	Schaffner-Chase EMC	CBL6111C	2629	061403	061403
Pre-amp	02320	HP	8447D	2443A03665	010403	010404
Antenna cable from bulkhead to antenna	N/A	Belden	9268	Cable #6	050602	050603
Antenna cable (10 meter site D)	NA	Andrew	LDF1-50	Cable#17	091102	091103

APPENDIX C:

MEASUREMENT DATA SHEETS

Test Location: CKC Laboratories Inc. •180 N Olinda Place • Brea CA, 92823 • 714-993-6112

Customer: **ADEMCO OmniTek**
Specification: **FCC 15.207 COND [AVE]**
Work Order #: **80252** Date: 03/27/2003
Test Type: **Conducted Emissions** Time: 14:13:24
Equipment: **Magnetic Card Reader** Sequence#: 9
Manufacturer: ADEMCO OmniTek Tested By: Stuart Yamamoto
Model: OmniSmart OS30 120V 60Hz
S/N: 0251

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Magnetic Card Reader*	ADEMCO OmniTek	OmniSmart OS30	0251

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Sprint	ASC-200	

Test Conditions / Notes:

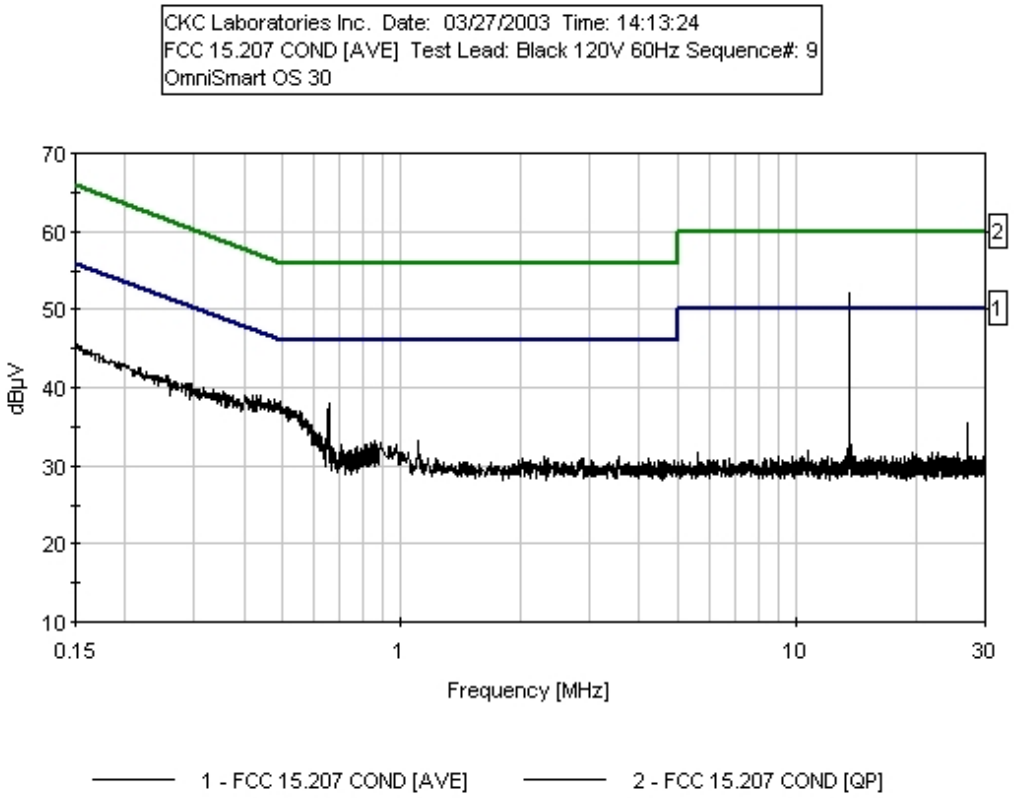
The EUT is stand alone on the tabletop. The AC to DC power adapter is plugged into the LISN and supplies 9VDC to the EUT. The EUT transmits at 13.56 MHz. The EUT is in continuous read mode. Temperature: 21°C, Humidity: 44%, Humidity: 100kPa.

Transducer Legend:

T1=Cable #16 070803

Measurement Data: Reading listed by margin. Test Lead: Black

#	Freq MHz	Rdng dBµV	T1 dB	dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	13.574M Ave	45.2	+0.3				+0.0	45.5	50.0	-4.5	Black
^	13.570M	51.7	+0.3				+0.0	52.0	50.0 See Average Data Above	+2.0	Black
3	655.404k	37.8	+0.1				+0.0	37.9	46.0	-8.1	Black
4	150.000k	45.5	+0.1				+0.0	45.6	56.0	-10.4	Black
5	858.293k	33.2	+0.1				+0.0	33.3	46.0	-12.7	Black
6	1.107M	33.0	+0.1				+0.0	33.1	46.0	-12.9	Black
7	760.121k	32.1	+0.1				+0.0	32.2	46.0	-13.8	Black
8	738.305k	31.9	+0.1				+0.0	32.0	46.0	-14.0	Black
9	27.122M	35.1	+0.4				+0.0	35.5	50.0	-14.5	Black
10	29.849M	32.1	+0.5				+0.0	32.6	50.0	-17.4	Black
11	22.093M	31.4	+0.3				+0.0	31.7	50.0	-18.3	Black


CKC Laboratories Inc. Date: 03/27/2003 Time: 14:13:24
FCC 15.207 COND [AVE] Test Lead: Black 120V 60Hz Sequence#: 9
OmniSmart OS 30
70
60
50
40
30
20
10
dBµV
0.15
1
10
30
Frequency [MHz]
2
1
1 - FCC 15.207 COND [AVE]
2 - FCC 15.207 COND [QP]

Test Location: CKC Laboratories Inc. •180 N Olinda Place • Brea CA, 92823 • 714-993-6112

Customer: **ADEMCO OmniTek**
Specification: **FCC 15.207 COND [AVE]**
Work Order #: **80252** Date: 03/27/2003
Test Type: **Conducted Emissions** Time: 14:04:04
Equipment: **Magnetic Card Reader** Sequence#: 10
Manufacturer: ADEMCO OmniTek Tested By: Stuart Yamamoto
Model: OmniSmart OS30 120V 60Hz
S/N: 0251

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Magnetic Card Reader*	ADEMCO OmniTek	OmniSmart OS30	0251

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Sprint	ASC-200	

Test Conditions / Notes:

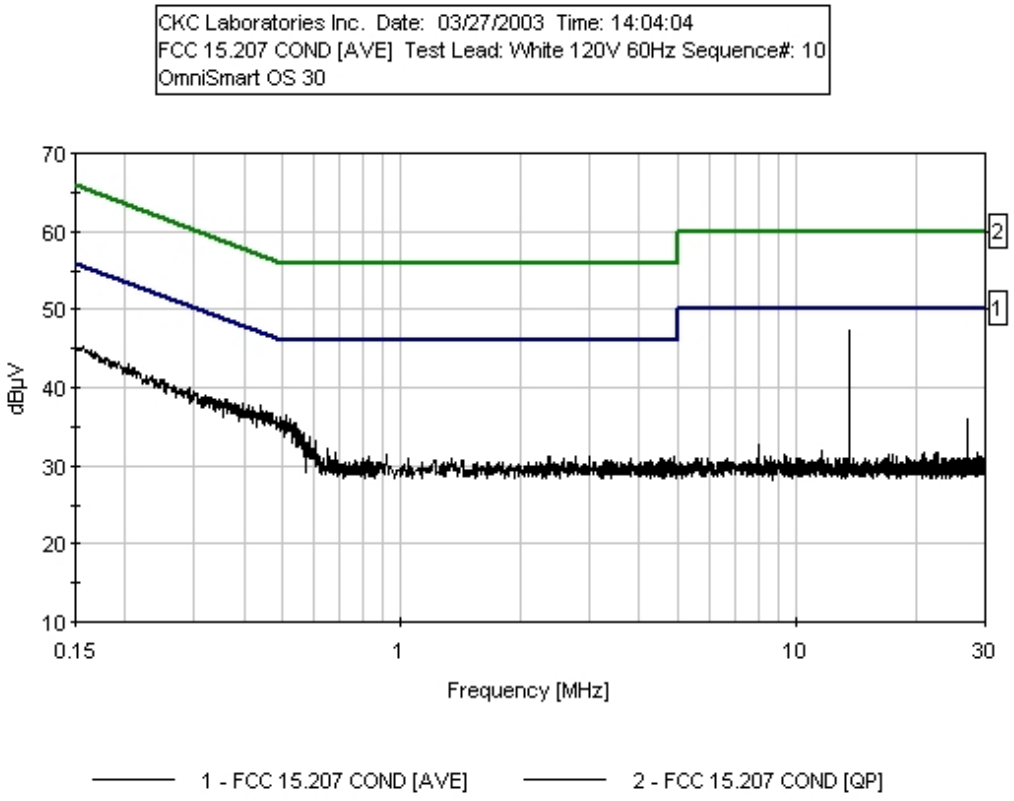
The EUT is stand alone on the tabletop. The AC to DC power adapter is plugged into the LISN and supplies 9VDC to the EUT. The EUT transmits at 13.56 MHz. The EUT is in continuous read mode. Temperature: 21°C, Humidity: 44%, Humidity: 100kPa.

Transducer Legend:

T1=Cable #16 070803

Measurement Data: Reading listed by margin. Test Lead: White

#	Freq MHz	Rdng dBµV	T1 dB	dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	13.575M Ave	40.2	+0.3				+0.0	40.5	50.0	-9.5	White
^	13.579M	47.0	+0.3				+0.0	47.3	50.0 See Average Data Above	-2.7	White
3	156.545k	45.1	+0.1				+0.0	45.2	55.6	-10.4	White
4	27.129M	35.6	+0.4				+0.0	36.0	50.0	-14.0	White
5	915.277k	31.4	+0.1				+0.0	31.5	46.0	-14.5	White
6	22.453M	31.4	+0.4				+0.0	31.8	50.0	-18.2	White
7	10.530M	25.9	+0.3				+0.0	26.2	50.0	-23.8	White


CKC Laboratories Inc. Date: 03/27/2003 Time: 14:04:04
FCC 15.207 COND [AVE] Test Lead: White 120V 60Hz Sequence#: 10
OmniSmart OS 30
70
60
50
40
30
20
10
dBµV
0.15
1
10
30
Frequency [MHz]
2
1
1 - FCC 15.207 COND [AVE]
2 - FCC 15.207 COND [QP]

Test Location: CKC Laboratories Inc. •180 N Olinda Place • Brea CA, 92823 • 714-993-6112

Customer: **ADEMCO OmniTek**
Specification: **FCC 15.225(a)**
Work Order #: **80252** Date: 03/11/2003
Test Type: **Maximized Emissions** Time: 09:30:20
Equipment: **Magnetic Card Reader** Sequence#: 1
Manufacturer: ADEMCO OmniTek Tested By: Stuart Yamamoto
Model: OmniSmart OS30
S/N: 0251

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Magnetic Card Reader*	ADEMCO OmniTek	OmniSmart OS30	0251

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward	6306D	988614

Test Conditions / Notes:

The EUT is stand alone on the tabletop. A DC power supply rests underneath the table and supplies the 5.4 VDC to power the EUT. The EUT transmits at 13.56 MHz. The EUT is in continuous read mode. Temperature: 19°C, Humidity: 47%, Humidity: 100kPa. Frequency range tested: 13.56 MHz.

Transducer Legend:

T1=6502 Active Loop Antenna T2=Cable Heliax #17 84ft(10 meter)
T3=Cable #6 (Ant to Bulkhead) 050603

Measurement Data: Reading listed by margin. Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	13.560M	45.5	+10.2	+0.4	+0.4		-19.0	37.5	80.0	-42.5	None

Test Location: CKC Laboratories Inc. •180 N Olinda Place • Brea CA, 92823 • 714-993-6112

Customer: **ADEMCO OmniTek**
Specification: **FCC 15.225/15.209**
Work Order #: **80252** Date: 03/11/2003
Test Type: **Maximized Emissions** Time: 11:34:40
Equipment: **Magnetic Card Reader** Sequence#: 2
Manufacturer: ADEMCO OmniTek Tested By: Stuart Yamamoto
Model: OmniSmart OS30
S/N: 0251

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Magnetic Card Reader*	ADEMCO OmniTek	OmniSmart OS30	0251

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward	6306D	988614

Test Conditions / Notes:

The EUT is stand alone on the tabletop. A DC power supply rests underneath the table and supplies the 5.4 VDC to power the EUT. The EUT transmits at 13.56 MHz. The EUT is in continuous read mode. Temperature: 19°C, Humidity: 47%, Humidity: 100kPa. Frequency range tested: 9 kHz to 1 GHz.

Transducer Legend:

T1=6502 Active Loop Antenna	T2=Cable Heliax #17 84ft(10 meter)
T3=Cable #6 (Ant to Bulkhead) 050603	T4=Bilog #00851 061403
T5=Cable#22 BNC (preamp to SA)	T6=Preamp 8447D 02320 (site D) 010404

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2 T6	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	27.121M	15.5	+8.8	+0.6	+0.5		+0.0	25.4	29.5	-4.1	None
2	935.738M	32.0	+0.0 +1.2	+3.3 -26.1	+3.7	+23.3	+0.0	37.4	46.0	-8.6	Vert
3	949.315M	30.3	+0.0 +1.2	+3.4 -26.1	+3.7	+23.5	+0.0	36.0	46.0	-10.0	Vert
4	271.253M	45.7	+0.0 +0.4	+1.8 -26.8	+1.9	+13.0	+0.0	36.0	46.0	-10.0	Vert
5	942.264M	28.9	+0.0 +1.2	+3.4 -26.1	+3.7	+23.4	+0.0	34.5	46.0	-11.5	Vert
6	94.976M	46.6	+0.0 +0.1	+1.1 -27.1	+1.1	+9.7	+0.0	31.5	43.5	-12.0	Vert
7	271.248M	43.3	+0.0 +0.4	+1.8 -26.8	+1.9	+13.0	+0.0	33.6	46.0	-12.4	Horiz
8	298.379M	42.1	+0.0 +0.4	+1.9 -26.7	+2.0	+13.4	+0.0	33.1	46.0	-12.9	Vert
9	284.811M	42.5	+0.0 +0.4	+1.8 -26.8	+1.9	+13.2	+0.0	33.0	46.0	-13.0	Vert
10	406.876M	37.9	+0.0 +0.5	+1.9 -27.0	+2.2	+16.1	+0.0	31.6	46.0	-14.4	Vert

11	989.977M	31.0	+0.0 +1.2	+3.8 -26.3	+3.8	+23.8	+0.0	37.3	54.0	-16.7	Vert
12	406.884M	34.9	+0.0 +0.5	+1.9 -27.0	+2.2	+16.1	+0.0	28.6	46.0	-17.4	Horiz
13	284.813M	38.0	+0.0 +0.4	+1.8 -26.8	+1.9	+13.2	+0.0	28.5	46.0	-17.5	Horiz
14	298.382M	36.8	+0.0 +0.4	+1.9 -26.7	+2.0	+13.4	+0.0	27.8	46.0	-18.2	Horiz
15	81.413M	38.5	+0.0 +0.1	+1.0 -27.1	+1.0	+7.9	+0.0	21.4	40.0	-18.6	Vert
16	108.517M	35.1	+0.0 +0.1	+1.1 -27.1	+1.1	+10.8	+0.0	21.1	43.5	-22.4	Vert
17	81.364M	19.7	+0.0 +0.1	+1.0 -27.1	+1.0	+7.9	+0.0	2.6	40.0	-37.4	Horiz