SUPERTEL TECHNOLOGIES, INC. TEST REPORT

FOR THE

EP-436 4-LINE WIRELESS TELEPHONE SYSTEM

FCC PART 15 SUBPART C SECTIONS 15.207 & 15.247

COMPLIANCE

DATE OF ISSUE: FEBRUARY 26, 2002

PREPARED FOR:

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PREPARED BY:

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5473A Clouds Rest
Mariposa, CA 95338

P.O. No.: STT-02-889
W.O. No.: 78176

Date of test: January 7 - Februrary 25, 2002

Report No.: FC02-015

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CKC Laboratories, Inc. has received Certificates of Accreditation from the following agencies:
A2LA (USA); BSMI (Taiwan); Nemko (Norway); and GOST (Russia).
CKC Laboratories, Inc has received test site Registration Acceptance from the following agencies:
FCC (USA); VCCI (Japan); and Industry Canada.
CKC Laboratories, Inc. has received Letters of Acceptance through an MRA for the following agencies:
ACA/NATA (Australia); SABS (South Africa); SWEDAC (Sweden); Radio Communications Agency (RA); HOKLAS (Hong Kong); Bakom (Swiss); BIPT (Belgium); Denmark Telestyrelsen; RvA (Netherlands); SEE (Luxembourg) SITTEL (Bolivia); and UKAS (UK).

ADMINISTRATIVE INFORMATION

DATE OF TEST:	January 7 - Februrary 25, 2002
DATE OF RECEIPT:	January 7, 2002
PURPOSE OF TEST:	To demonstrate the compliance of the EP-436 4-Line Wireless Telephone System with the requirements for FCC Part 15 Subpart C Sections 15.207 & 15.247 devices.
TEST METHOD:	ANSI C63.4 (1992)
MANUFACTURER:	SuperTel Technologies, Inc. 3245 146th Place SE, Suite 370 Bellevue, WA 98007
REPRESENTATIVE:	Eric Waunch
TEST LOCATION:	CKC Laboratories, Inc. 22105 Wilson River Hwy, Tillamook, OR 97141 5473A Clouds Rest, Maripos, CA 95338

SUMMARY OF RESULTS

As received, the SuperTel Technologies, Inc. EP-436 4-Line Wireless Telephone System was found to be fully compliant with the following standards and specifications:

United States

FCC Part 15 Subpart C Sections 15.207 & 15.247
ANSI C63.4 (1992) method

Canada

RSS-210 using:
FCC Part 15 Subpart C Sections 15.207 & 15.247
ANSI C63.4 (1992) method
Industry of Canada File No. IC 3173-A
Industry of Canada File No. IC 3082-D

CONDITIONS FOR COMPLIANCE

No modifications to the EUT were necessary to comply.

APPROVALS

QUALITY ASSURANCE:

Dennis Ward, Quality Manager

Robert Nees, Lab Manager

Ron Dulmage, Chief Operations Officer

Chuck Kendall, EMC/Lab Manager

TEST PERSONNEL:

Mike Wilkinson, Test Engineer

Mark Chase, EMC Engineer

Andrew Pace, Test Engineer

Randy Clark, EMC Engineer

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The EUT is a cordless telephone system consisting of one handset and one base unit. Both units are frequency hopping transceivers. The EUT tested by CKC Laboratories represents how production units will be produced.

EUT Operating Frequency
The EUT was operating at 902-928 MHz.

Mode of Operation
The EUT was tested while operating in a normal mode of operation. Direct connect tests were tested on individual channel selections. The handset was tested in all three orthogonal planes while operating on battery power. While in the cradle, the handset only charges the batteries, therefore, only 15.209 and 15.207 testing was required. The handset has two antennas, but they are of the same type and, therefore, only the highest gain antenna was tested.

15.31(m) Number Of Channels
This device operates in the range of 902-928 MHz. In accordance with 15.31(m) the frequencies tested were channels 902, 915 and 928 MHz.

15.33(a) Frequency Ranges Tested
15.207 Conducted: 450 kHz – 30 MHz
15.209/15.247 Radiated: 9 kHz – 10 GHz

15.203 Antenna Requirements
The device is equipped with reverse thread proprietary connectors and, therefore, complies with Section 15.203 of the FCC rules.

15.205 Restricted Bands
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. The fundamental operating frequency lies outside the restricted bands and, therefore, complies with the requirements of Section 15.205 of the FCC rules.

15.215 Additional Provisions to the General Radiated Emission Limitations
The fundamental frequency was kept within the central 80% of the permitted band in order to minimize the possibility of out-of-band operation. Refer to Appendix B for the test equipment used.

EQUIPMENT UNDER TEST

EP-436 4-Line Wireless Telephone System consisting of:

Handset

Manuf:	SuperTel Technologies, Inc.
Model:	EP-436 Handset
Serial:	ENG-1
FCC ID:	NNA-EP-436

Base

Manuf:	SuperTel Technologies, Inc.
Model:	EP-436 Base Set
Serial:	ENG-1
FCC ID:	NNA-EP-436

Battery Charger

Manuf:	SuperTel Technologies, Inc.
Model:	ENG-CH
Serial:	None
FCC ID:	DoC

Power Supply

Manuf:	SENAO
Model:	AM-71000
Serial:	None
FCC ID:	DoC

PERIPHERAL DEVICES

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

Remote CO Simulator

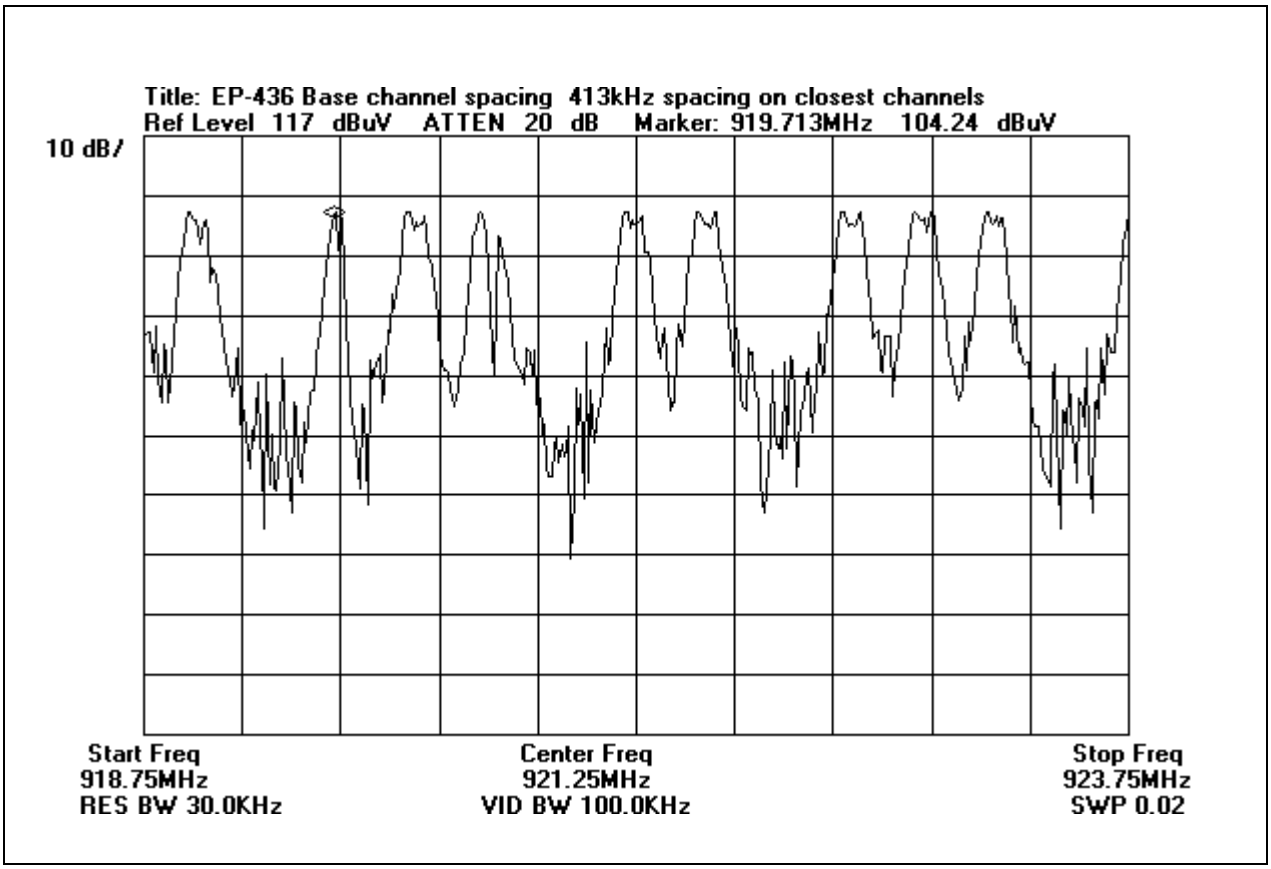
Manuf:	Teltone
Model:	TLS-5
Serial:	029081
FCC ID:	DoC

CD Player

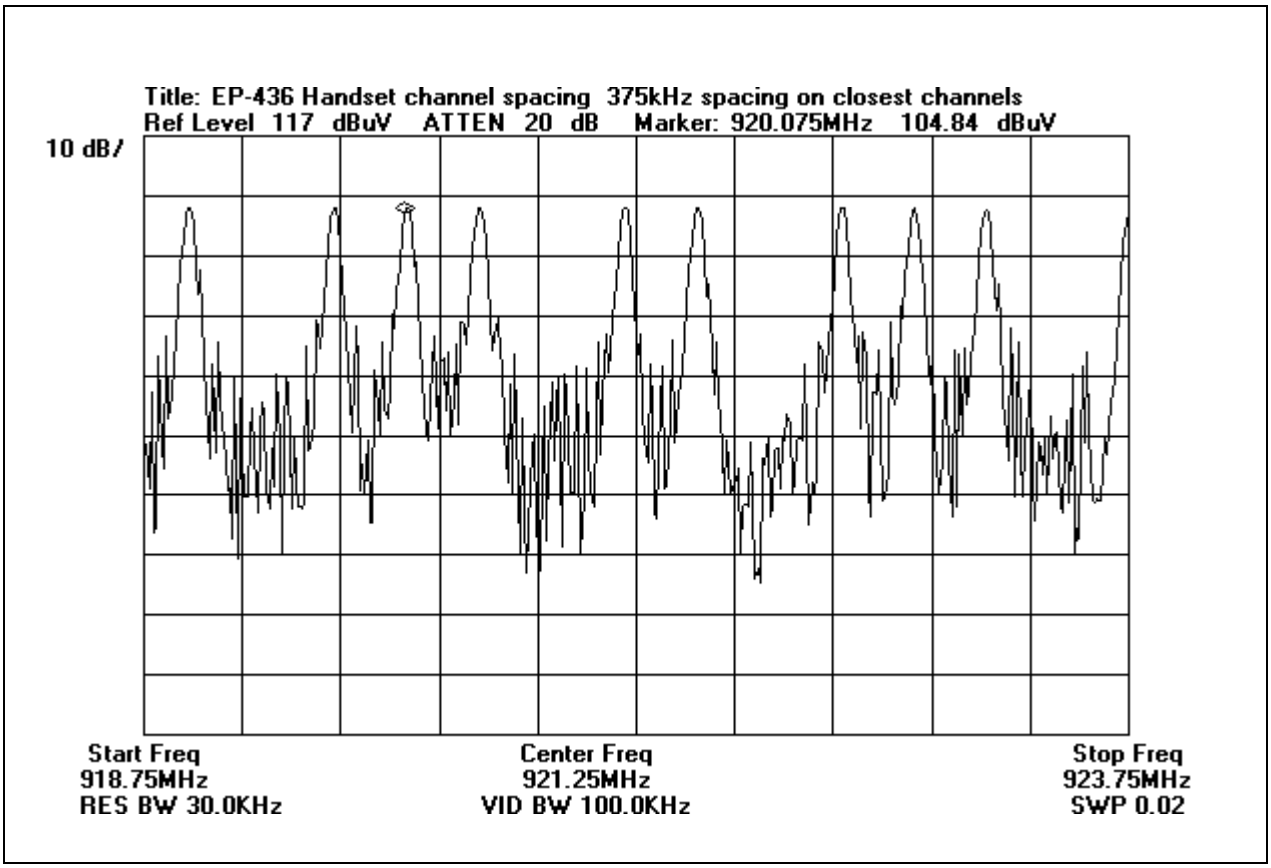
Manuf:	Sony
Model:	D-131
Serial:	5658402
FCC ID:	DOC

REPORT OF MEASUREMENTS

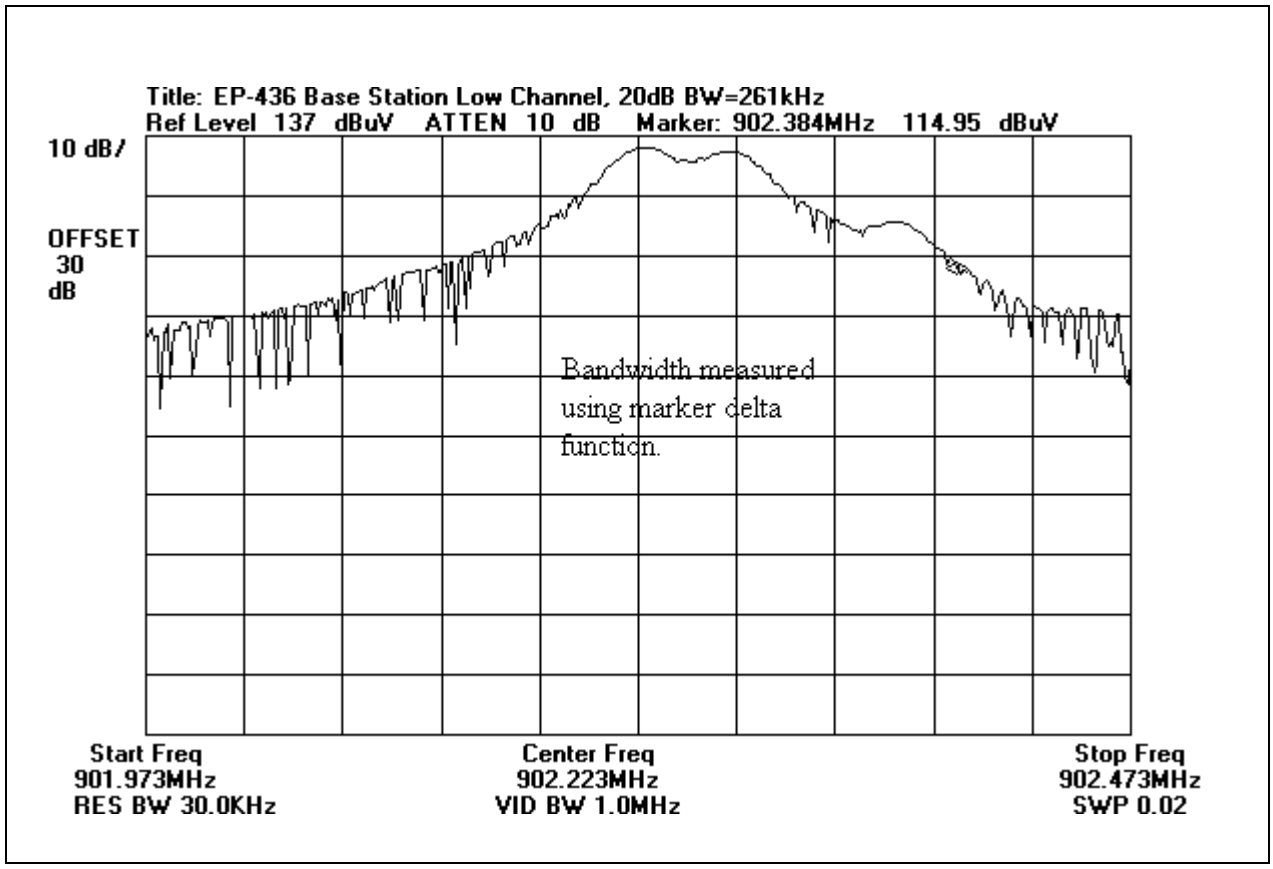
15.247(a)(1) BASE - CHANNEL SEPARATION



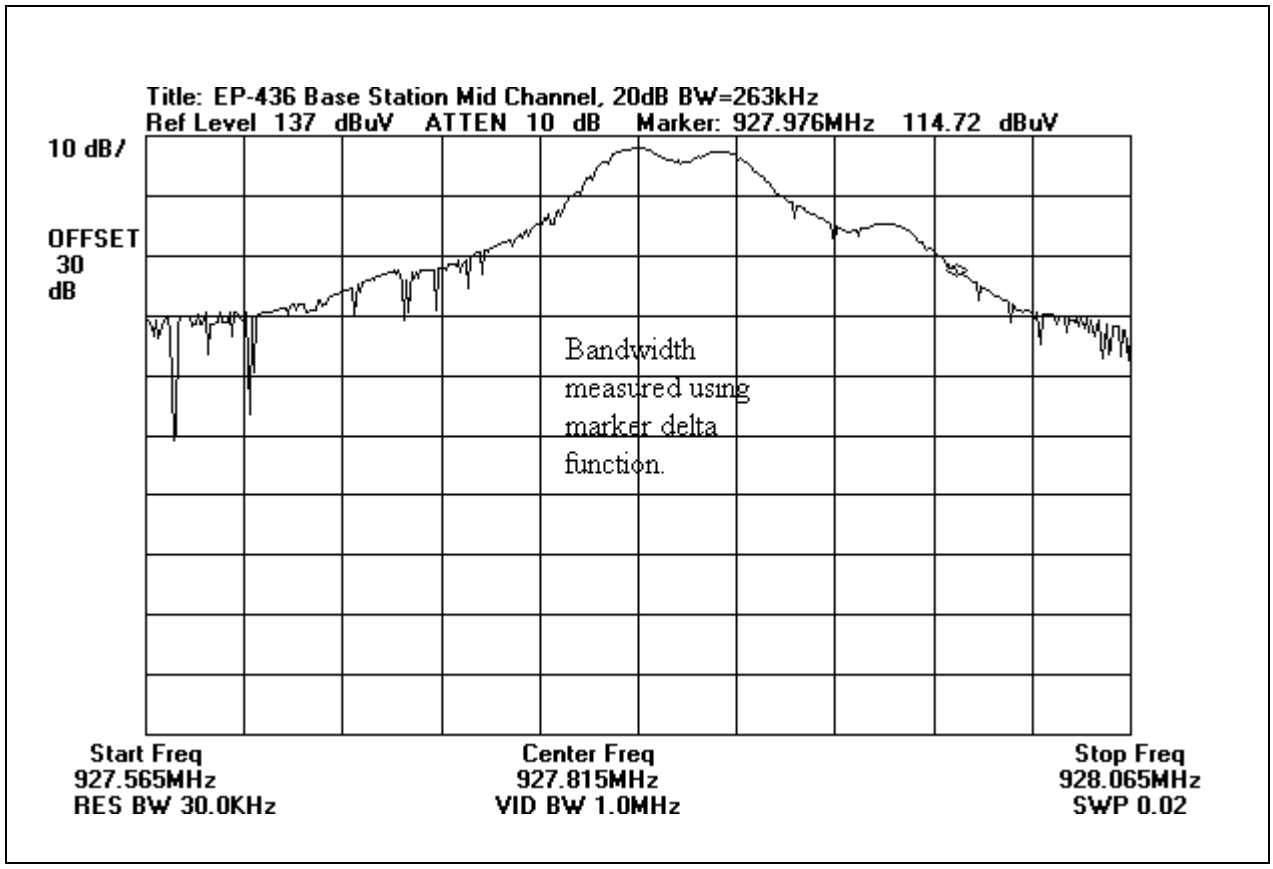
15.247(a)(1) HANDSET - CHANNEL SEPARATION



15.247(a)(1)(i) BASE - BANDWIDTH LOW CHANNEL



15.247(a)(1)(i) BASE - BANDWIDTH MIDDLE CHANNEL



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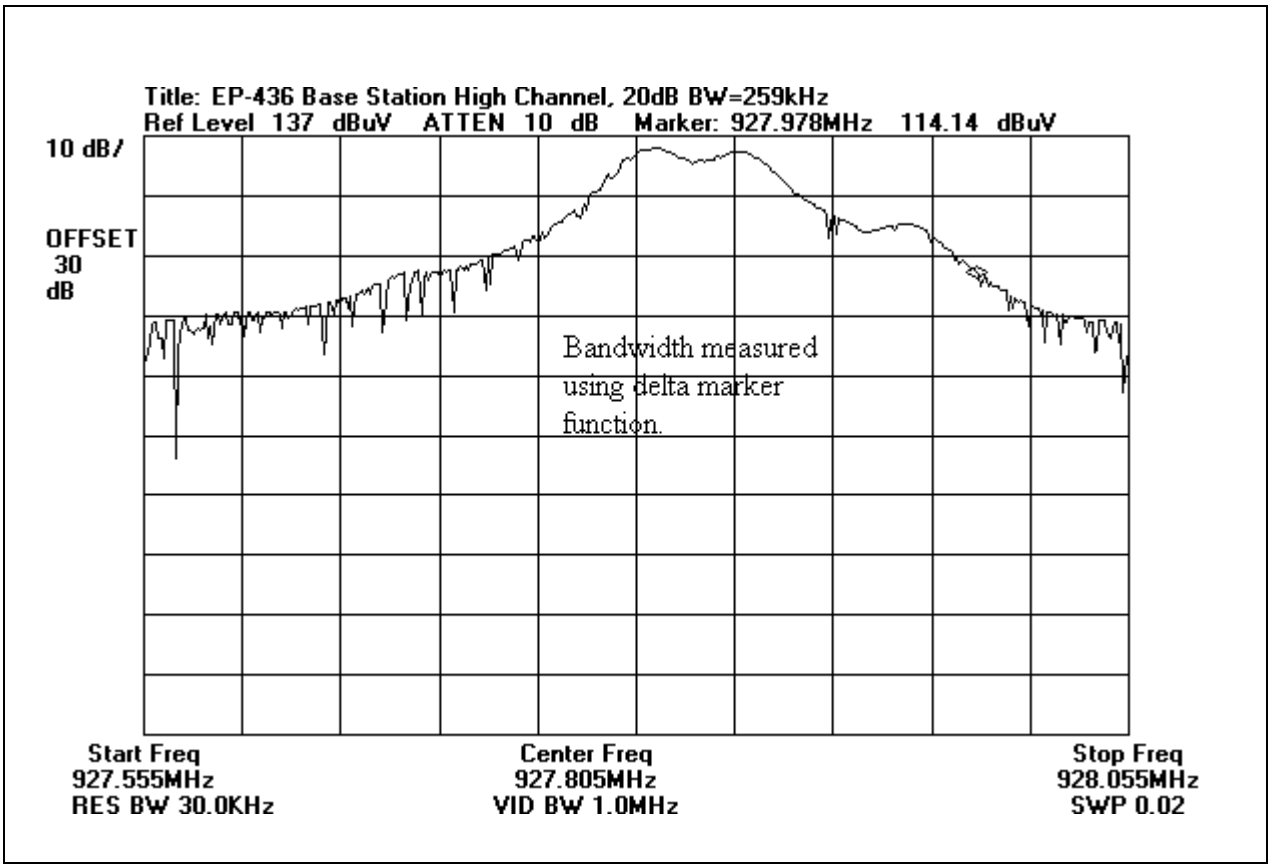

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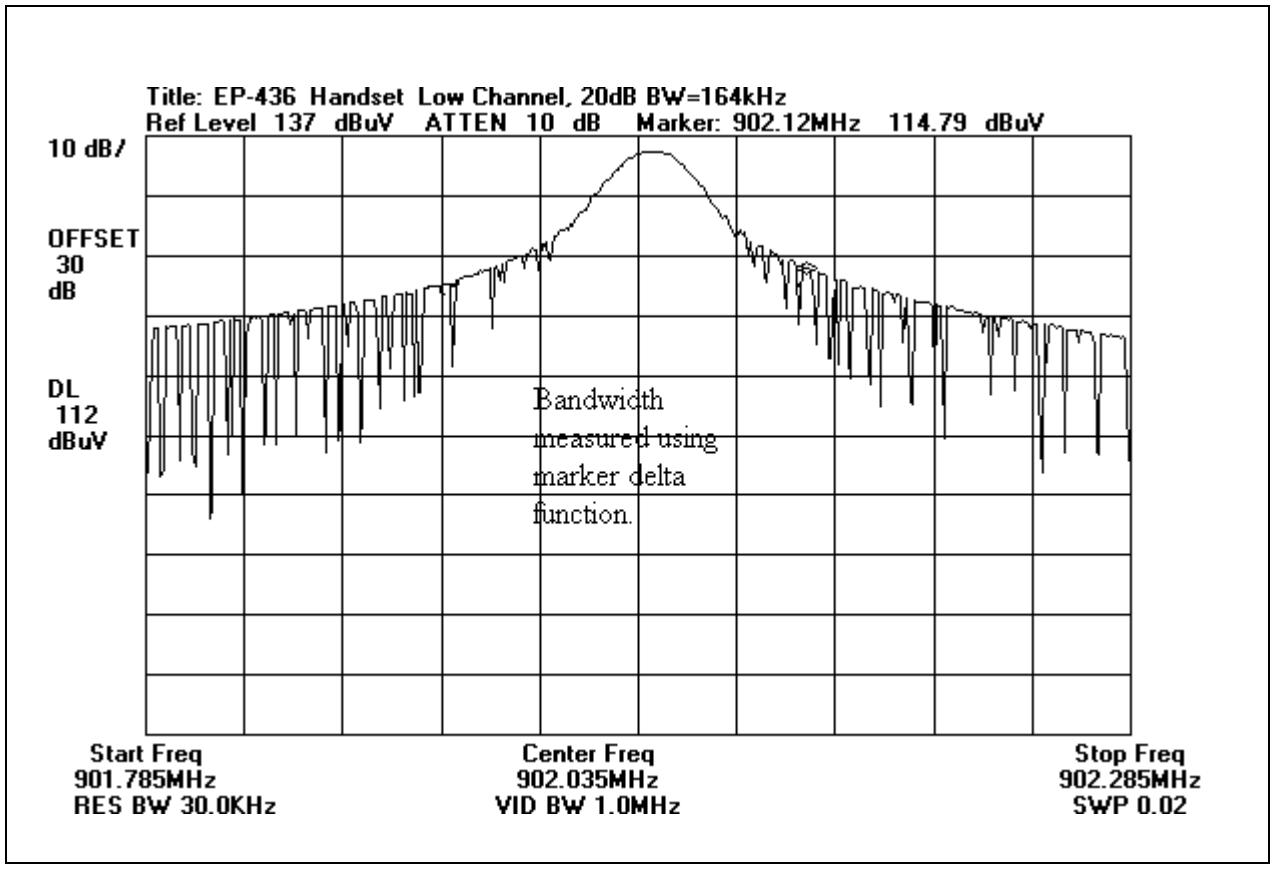

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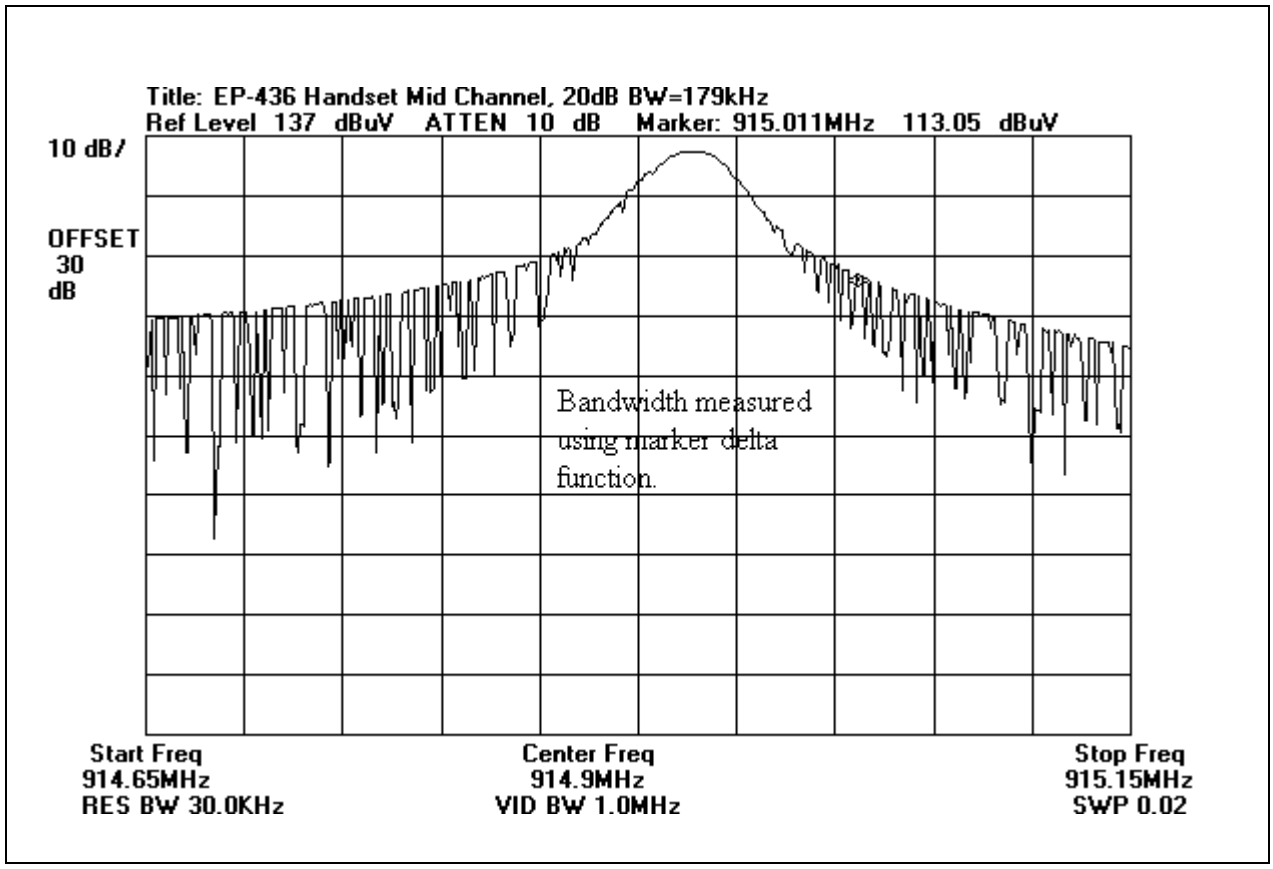
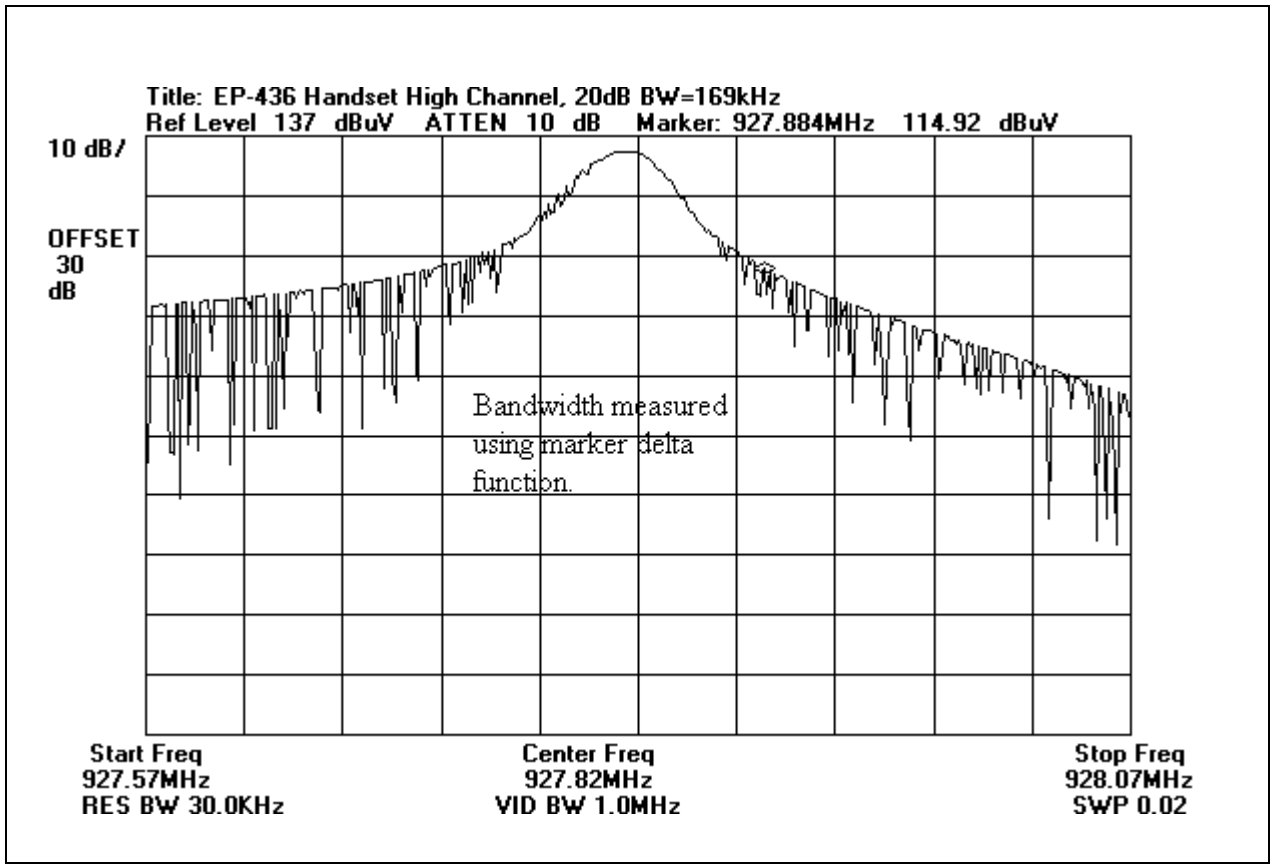
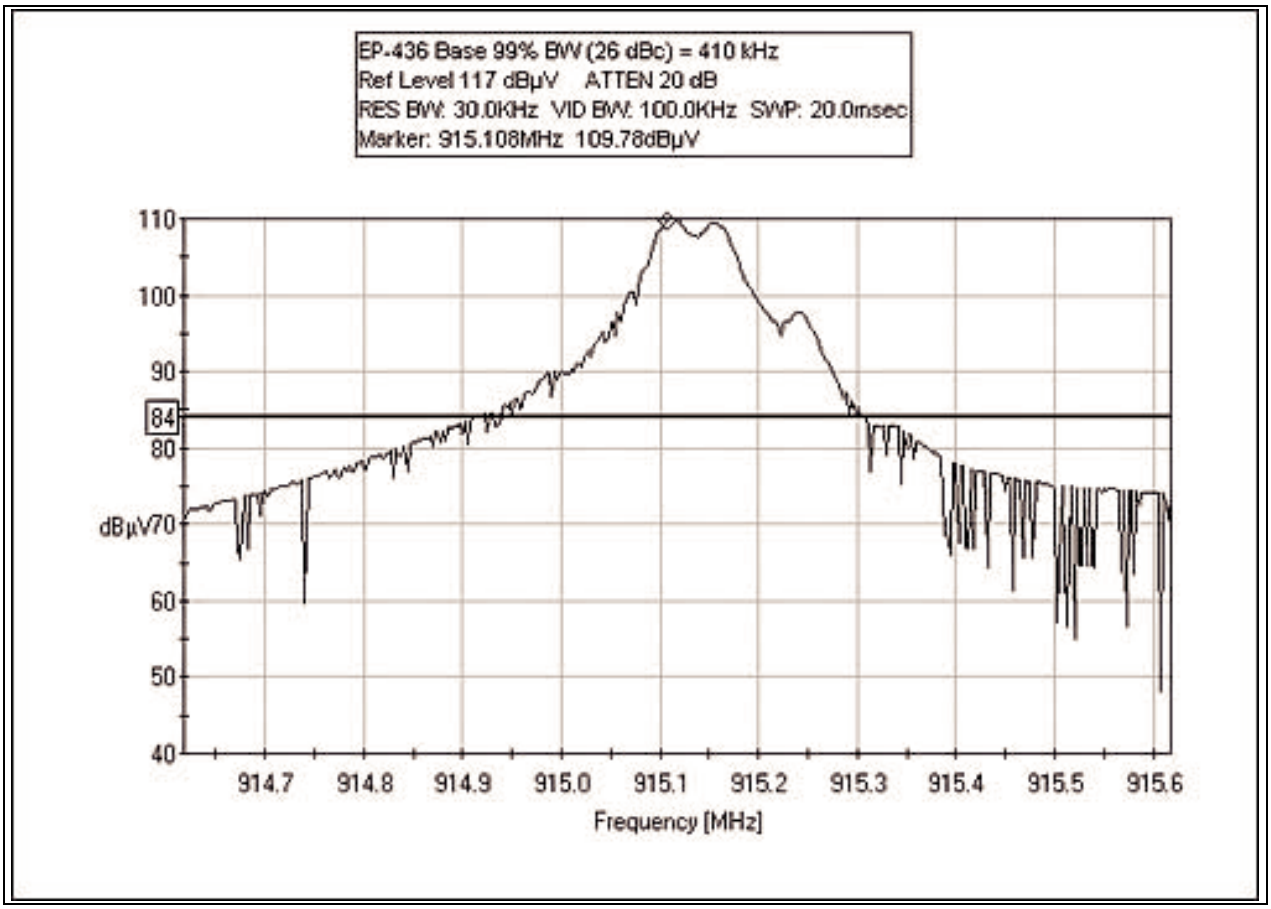


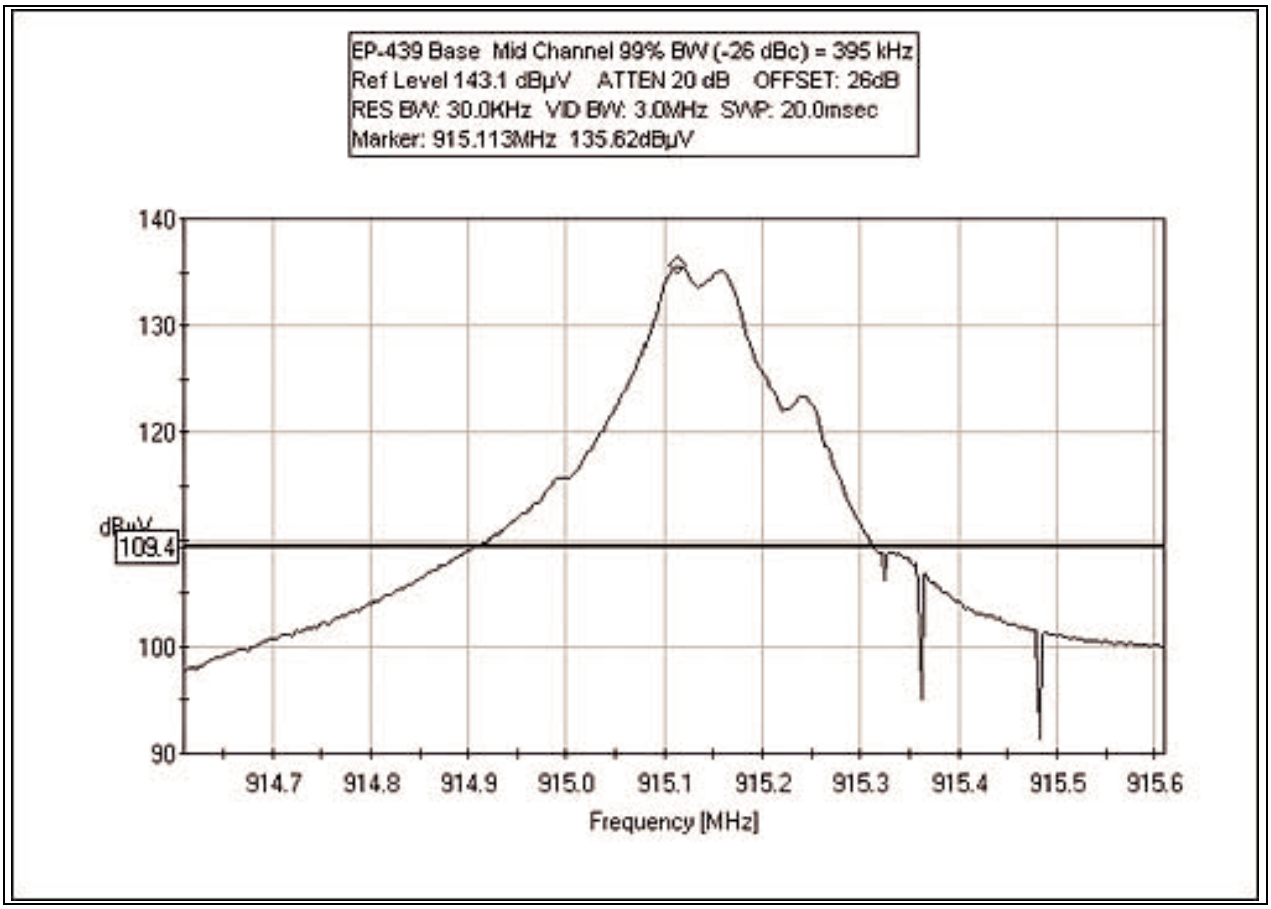
15.247(a)(1)(i) HANDSET - BANDWIDTH HIGH CHANNEL



RSS-210 BASE 99% BANDWIDTH - LOW CHANNEL



RSS-210 BASE 99% BANDWIDTH - MIDDLE CHANNEL



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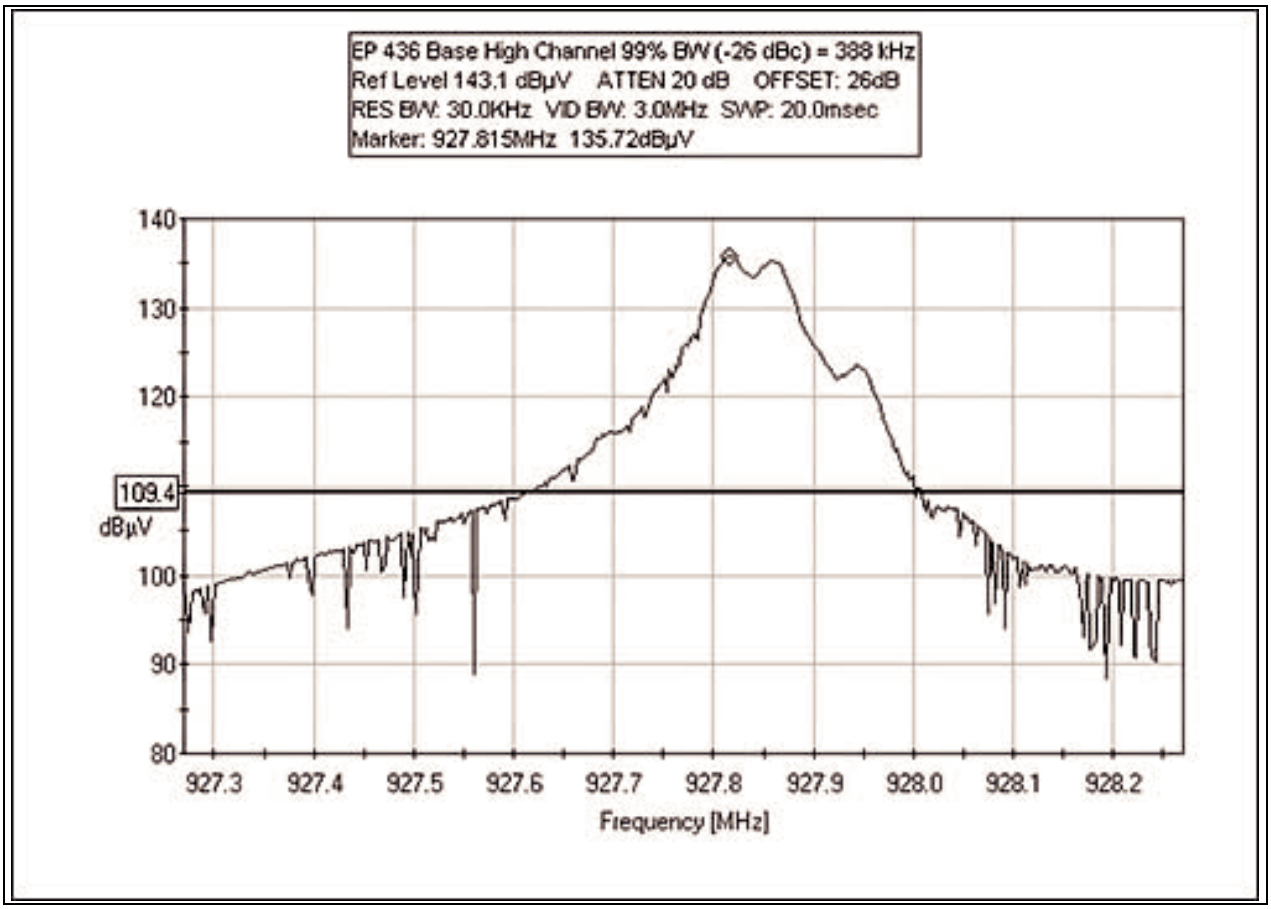
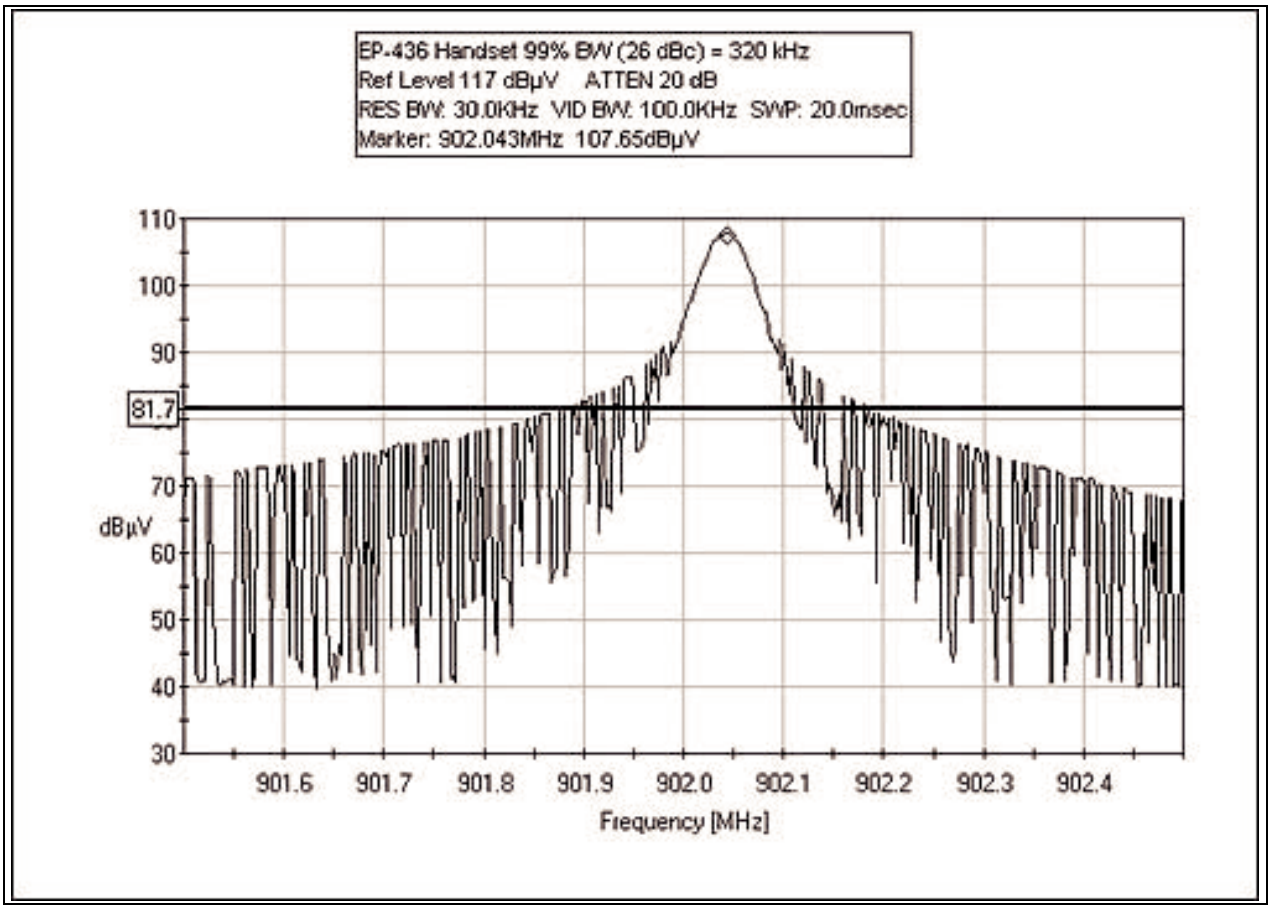
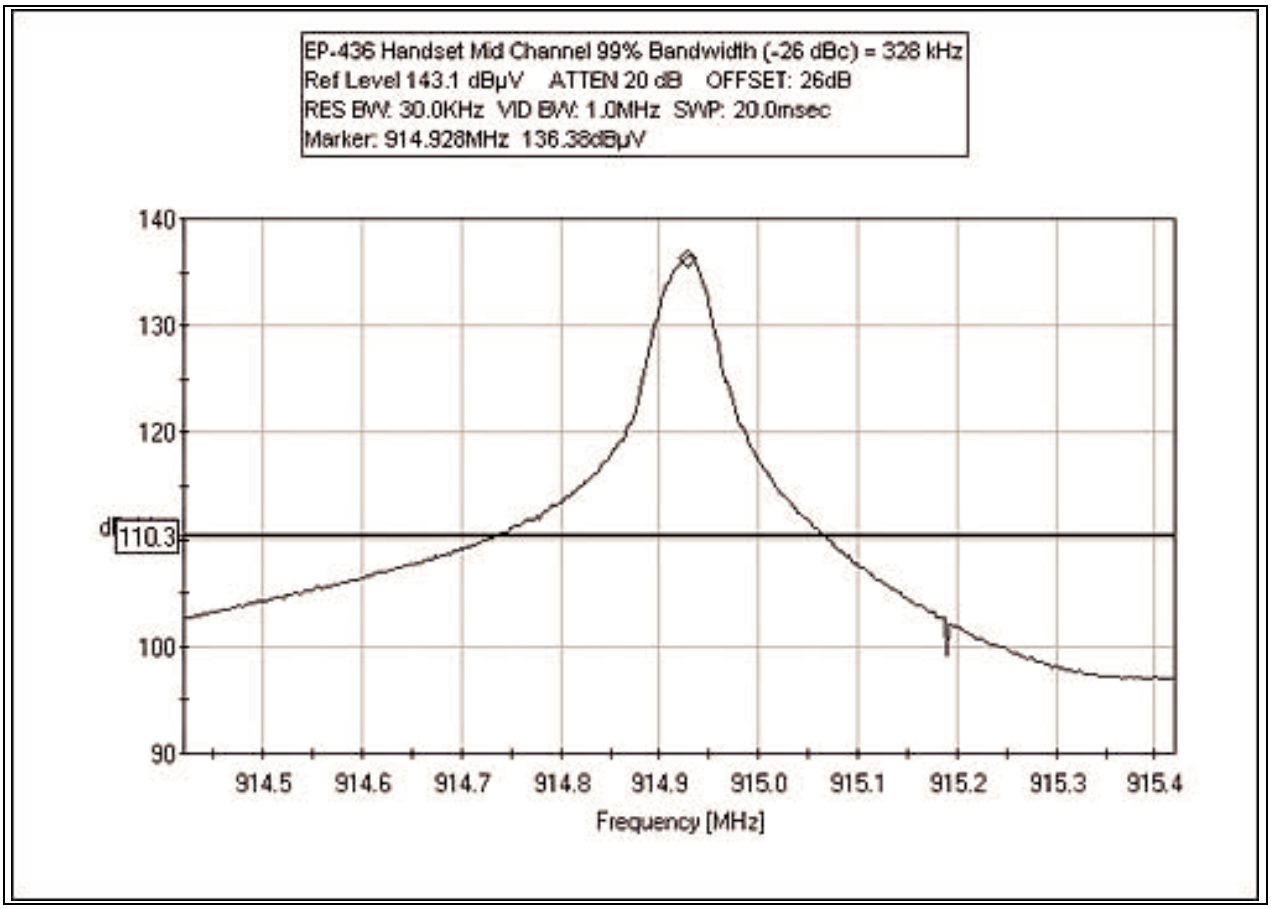


RSS-210 HANDSET 99% BANDWIDTH - LOW CHANNEL

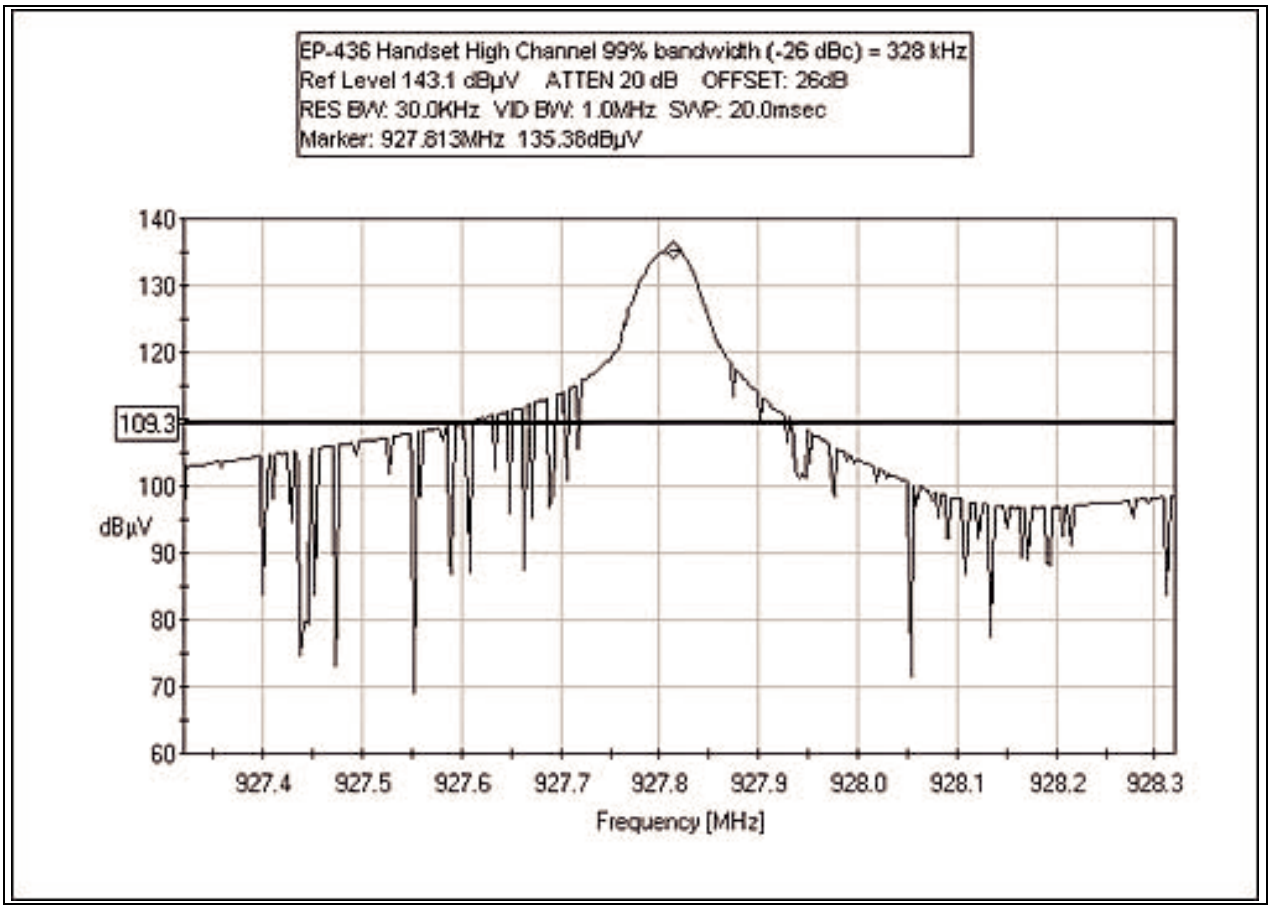


RSS

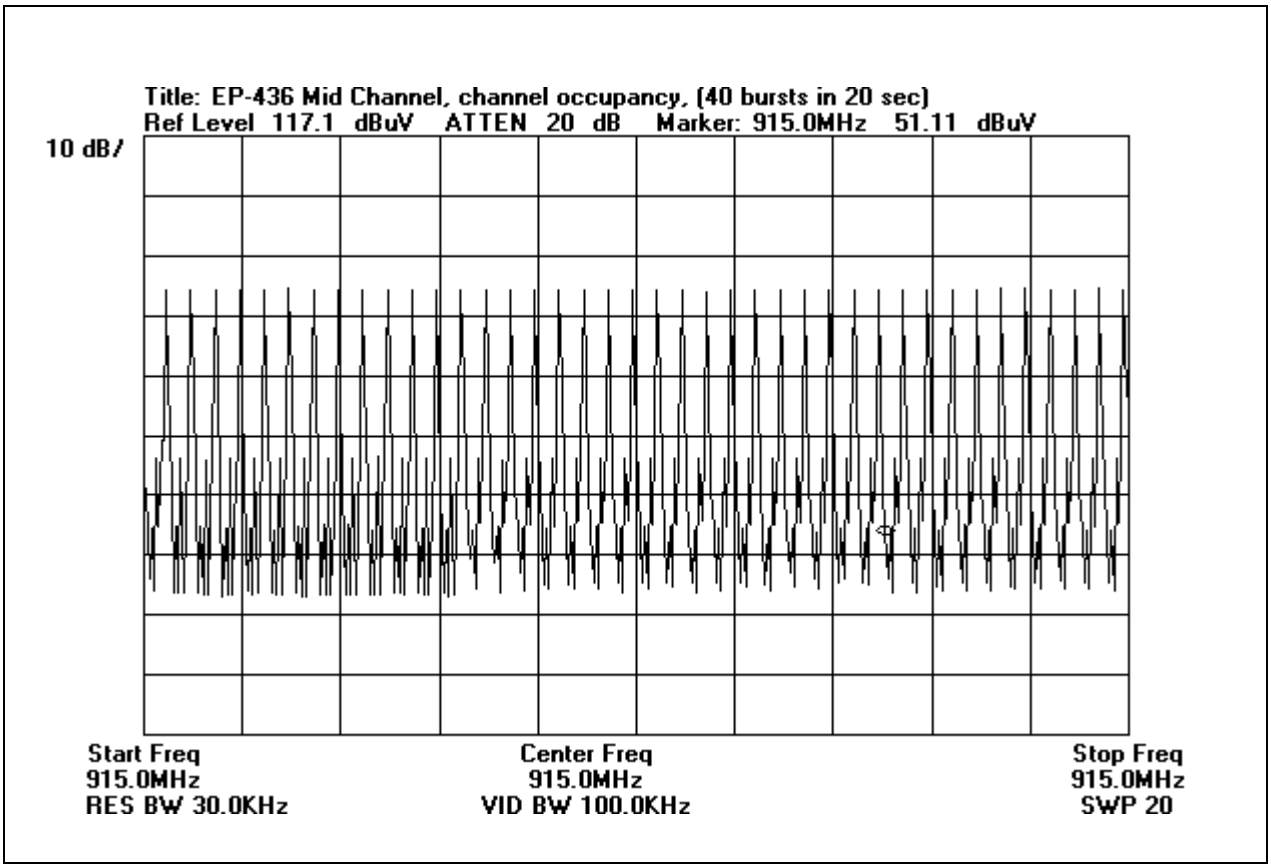
RSS-210 HANDSET 99% BANDWIDTH - MIDDLE CHANNEL



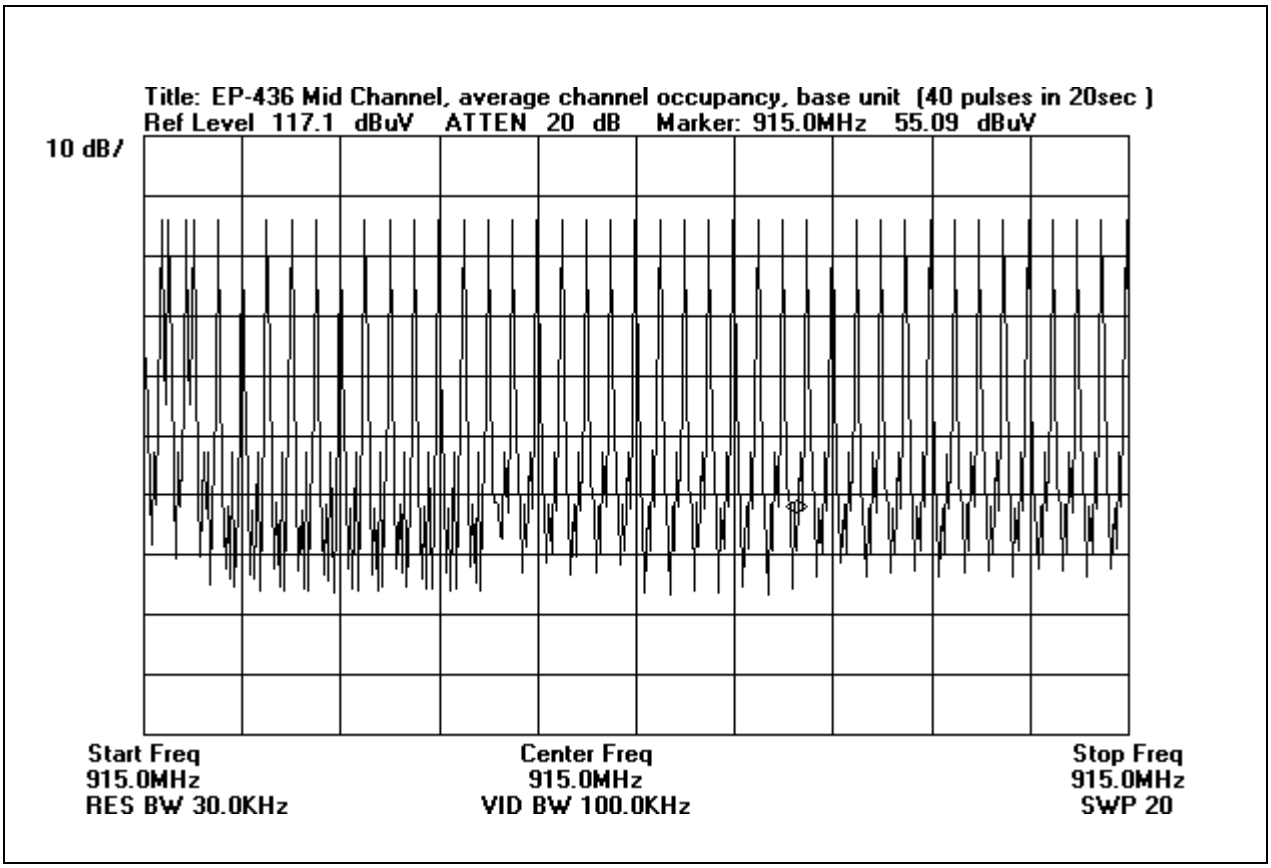
RSS-210 HANDSET 99% BANDWIDTH - HIGH CHANNEL



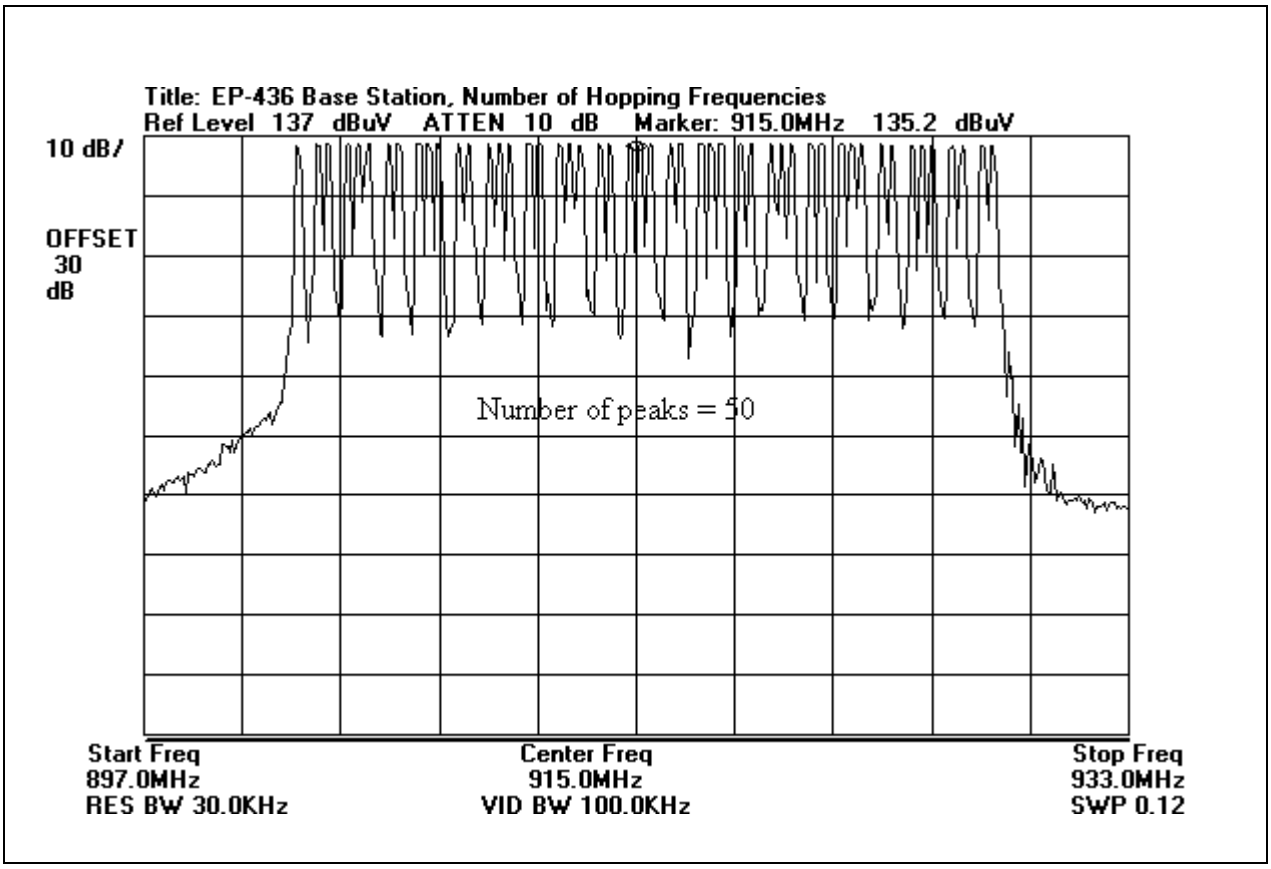
15.247(a)(1)(i) BASE AVERAGE OCCUPANCY



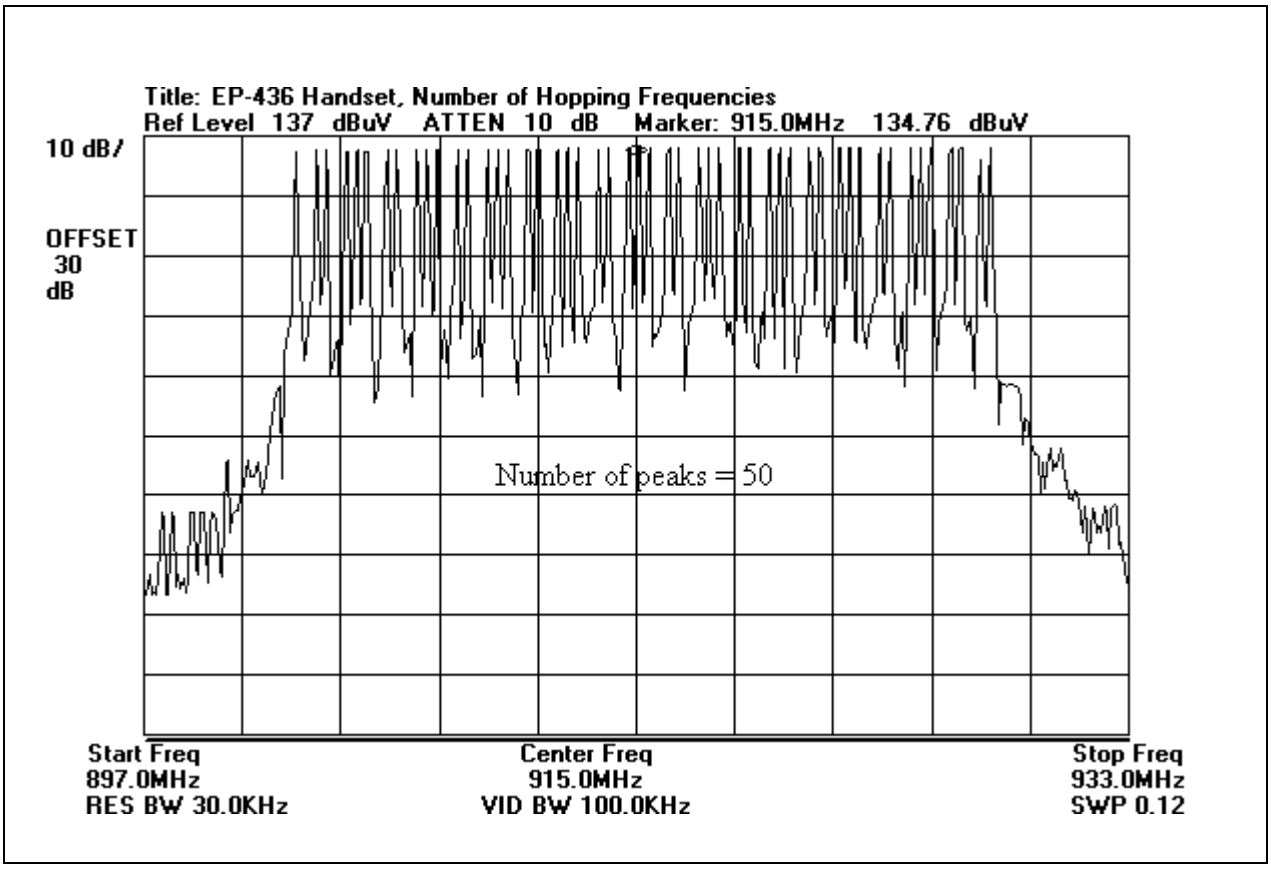
15.247(a)(1)(i) HANDSET AVERAGE OCCUPANCY



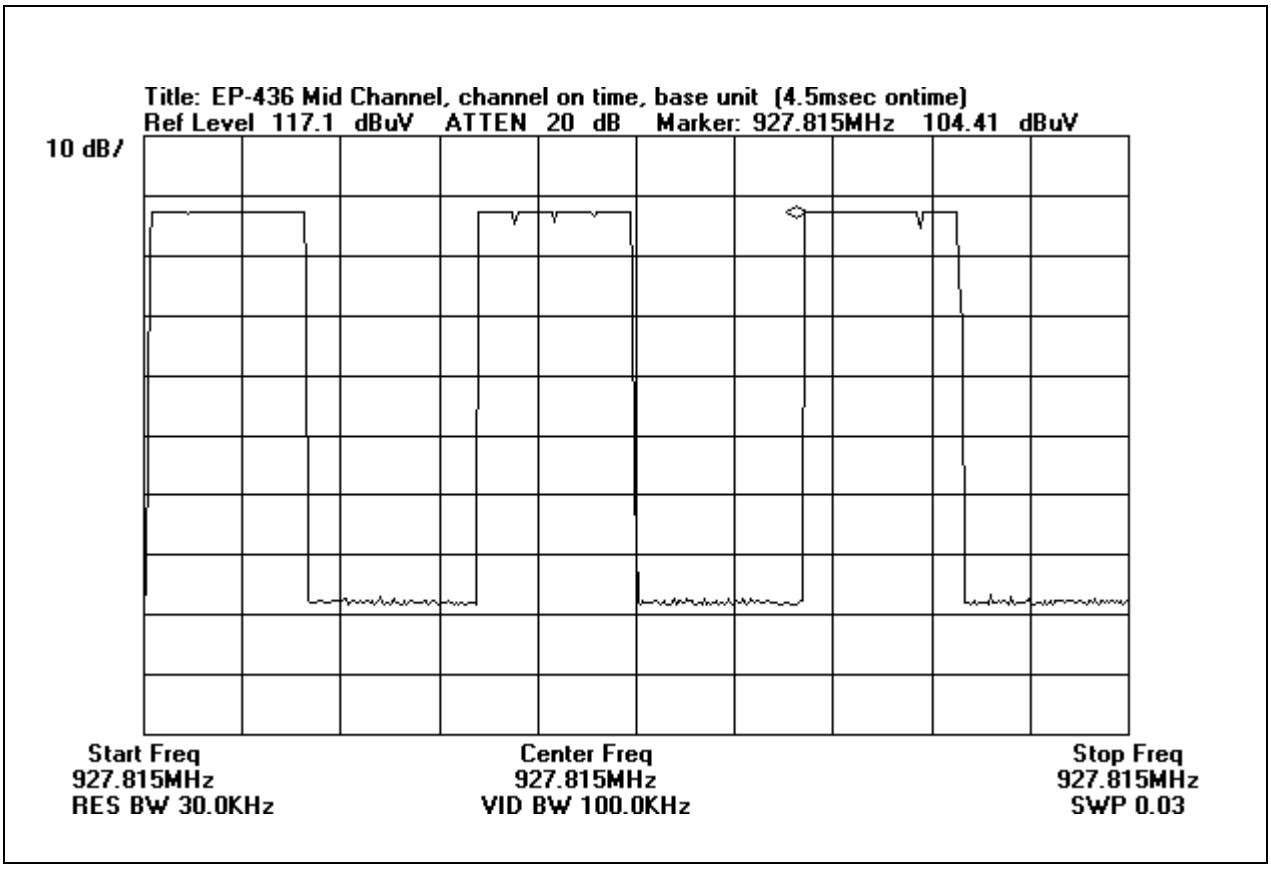
15.247(a)(1)(i) BASE NUMBER OF HOPS



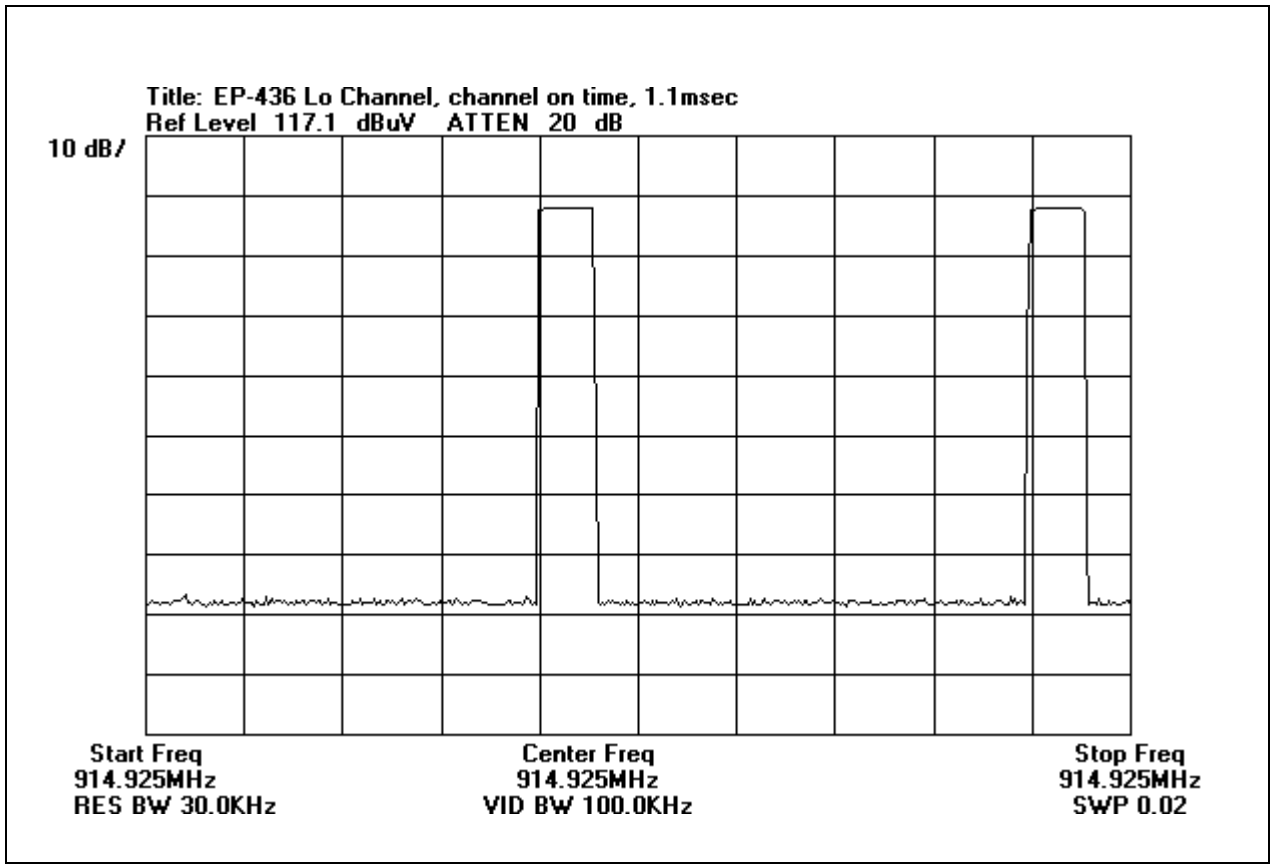
15.247(a)(1)(i) HANDSET NUMBER OF HOPS



15.247(a)(1)(i) BASE ON TIME



15.247(a)(1)(i) HANDSET ON TIME



The following tables report the six highest worst case levels recorded during the tests performed on the EP-436 4-Line Wireless Telephone System. All readings taken are peak readings unless otherwise noted. The data sheets from which these tables were compiled are contained in Appendix C.

Table 1: 15.247(b)(2) Base Highest Peak Output: EIRP

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
902.250	109.4	24.9		1.2	-10.0	125.5	137.0	-11.5	V-1
902.250	97.7	24.9		1.2	-10.0	113.8	137.0	-23.2	H-1
915.020	109.9	24.9		1.2	-10.0	126.0	137.0	-11.0	V-2
915.200	98.8	24.9		1.2	-10.0	114.9	137.0	-22.1	H-2
927.700	99.1	25.0		1.2	-10.0	115.3	137.0	-21.7	H-3
927.770	109.9	25.0		1.2	-10.0	126.1	137.0	-10.9	V-3

Test Method: ANSI C63.4 (1992)
Spec Limit : FCC Part 15 Subpart C Section 15.247(b)(2)
Test Distance: 1 Meter

NOTES: H = Horizontal Polarization
V = Vertical Polarization
1 = Low Channel
2 = Middle Channel
3 = High Channel

COMMENTS: The channels are locked and are stepped through manually. The low channel = 902 MHz, mid channel = 915 MHz and high channel = 928 MHz. Channel setting is as indicated for each reading in the datasheet. 2 dBi gain antenna are connected to the EUT. EUT antenna is in the vertical position. EIRP was calculated using the corrected reading in the datasheet less the distance correction factor and (EIRP) Peak power=(Ed)^2/30G. Calculated EIRP for the readings are: 928 MHz vertical, meter 109.9 + 26.2 = 136.1 dBuV = 0.856 Watt. 915 MHz vertical, meter 109.9 + 26.1 = 136.0 dBuv = 0.837 Watt. 902 MHz Vertical, meter 109.4 + 26.1 = 135.5 dBuv = 0.746 Watt. 928 MHz horizontal, meter 99.1 + 26.2 = 125.3 dBuV = 0.072 Watt. 915 MHz horizontal, meter 98.8 + 26.1 = 124.9 dBuV = 0.065 Watt. 902 MHz horizontal, meter 97.7 + 26.1 + 123.8 dBuV = 0.050 Watt.

Table 2: 15.247(b)(2)/15.31(e) Base Voltage Variation on Peak Power				
FREQUENCY MHz	**CORRECTED READING dBµV/m**	**85%**	**115%**	**SPEC LIMIT dBµV/m**
902	135.5	135.6	135.5	137.0
915	135.5	135.6	135.5	137.0
928	135.4	135.3	135.3	137.0

Test Method: ANSI C63.4 (1992) NOTES:
Spec Limit : FCC Part 15 Subpart C Section 15.247(b)(2)/15.31(e)
Test Distance: No Distance

COMMENTS: The channels are locked and are stepped through manually. The low channel = 902 MHz, mid channel = 915 MHz and high channel =928 MHz. Channel setting is as indicated for each reading in the datasheet. AC power input was set to 102 VAC (85%), 120 VAC (nominal) and 138 VAC (115%) for each channel as indicated for each reading in the datasheet. EUT is connected directly to the Spectrum Analyzer through a 30 dB attenuator. Highest output was 135.6 dBuV = 0.724 Watt.

Table 3: 15.247(c)/15.209 Base OATS Highest Emission Levels: 3MHz-10GHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Ant dB	Amp dB	Cable dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
791.596	50.4	21.8	-27.9	0.0	0.0	44.3	46.0	-1.7	VQ-1
817.180	47.0	22.1	-27.8	0.0	0.0	41.3	46.0	-4.7	VQ-3
1038.350	53.3	24.3	-27.3	0.0	0.0	50.3	54.0	-3.7	VA-3
1804.447	69.2	29.0	-42.0	2.5	-10.0	48.7	54.0	-5.3	VA-1
4639.127	62.0	33.0	-40.0	3.3	-10.0	48.3	54.0	-5.7	V-3
7320.703	58.6	34.5	-38.0	3.8	-10.0	48.9	54.0	-5.1	V-2

Test Method: ANSI C63.4 (1992)
Spec Limit : FCC Part 15 Subpart C Section 15.247(c)/15.209
Test Distance: 1 and 3 Meters

NOTES: V = Vertical Polarization
A = Average Reading
Q = Quasi Peak Reading
1 = Low Channel
2 = Middle Channel
3 = High Channel

COMMENTS: The channels are locked and are stepped through manually. The low channel = 902 MHz, mid channel = 915 MHz and high channel =928 MHz. Channel setting is as indicated for each reading in the datasheet. EUT antenna is in the vertical position. 2 dBi gain antenna connected to the EUT. Base L-1 port is connected to the remote located CO Simulator via a 20 foot RJ-11 cable. L-2 through L-4 ports have unterminated 2 meter RJ 11 cables attached. Audio port is connected, via a 2 meter audio cable, to the CD Player which is playing a music CD. The EP-436 Handset is placed in the charger and is in the ring only mode. Test distance is 1 meter 0.9 GHz to 10.0 GHz. Test distance is 3 meters 15 MHz to 900 MHz. Frequency range investigated was 3 MHz to 10 GHz (lowest oscillator = 3.579 MHz, highest oscillator = 928 MHz).

Table 4: 15.247(c)/15.209 Base Terminal Highest Emission Levels: 9kHz-10GHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Ant dB	Amp dB	Cable dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
1025.850	87.4	0.0				87.4	115.0	-27.6	N-2
791.599	85.6	0.0				85.6	115.0	-29.4	N-1
817.180	85.2	0.0				85.2	115.0	-29.8	N-3
1804.460	91.1	0.0				91.1	115.0	-23.9	N-1
1830.400	90.5	0.0				90.5	115.0	-24.5	N-2
1855.830	89.3	0.0				89.3	115.0	-25.7	N-3

Test Method: ANSI C63.4 (1992)
Spec Limit : FCC Part 15 Subpart C Section 15.247(c)

NOTES: N = No Polarization
1 = Low Channel
2 = Middle Channel
3 = High Channel

COMMENTS: Testing to show compliance of the EP-436 Base Station to 47 CFR 15.247(c) conducted spurious emissions 9kHz - 10GHz. EP-436 Base Station, conducted spurious emissions Check. Fundamentals are measured. The lowest strength fundamental - 20dB is then programmed as the limit line.

Table 5: 15.207 Base Highest Conducted Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Lisn dB	dB	Cable dB	dB	CORRECTED READING dBµV	SPEC LIMIT dBµV	MARGIN dB	NOTES
0.451672	42.6	0.1		0.2		42.9	48.0	-5.1	W
0.451672	42.3	0.1		0.2		42.6	48.0	-5.4	B
0.461701	42.5	0.1		0.2		42.8	48.0	-5.2	B
0.465044	41.9	0.1		0.2		42.2	48.0	-5.8	W
0.473402	41.5	0.1		0.2		41.8	48.0	-6.2	B
0.495969	41.5	0.1		0.2		41.8	48.0	-6.2	B

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

NOTES: B = Black Lead
W = White Lead

COMMENTS: The channels are locked and set to High Channel. EUT antenna is in the vertical position. 2 dBi gain antenna connected to the EUT. Base L-1 port is connected to the remote located CO Simulator via a 20 foot RJ-11 cable. L-2 through L-4 ports have unterminated 2 meter RJ 11 cables attached. Audio port is connected, via a 2 meter audio cable, to the CD Player which is playing a music CD. The EP-436 Handset is placed in the charger and is in the ring only mode. Frequency range investigated was 450 kHz to 30 MHz. Base set connected to measurement LISN.

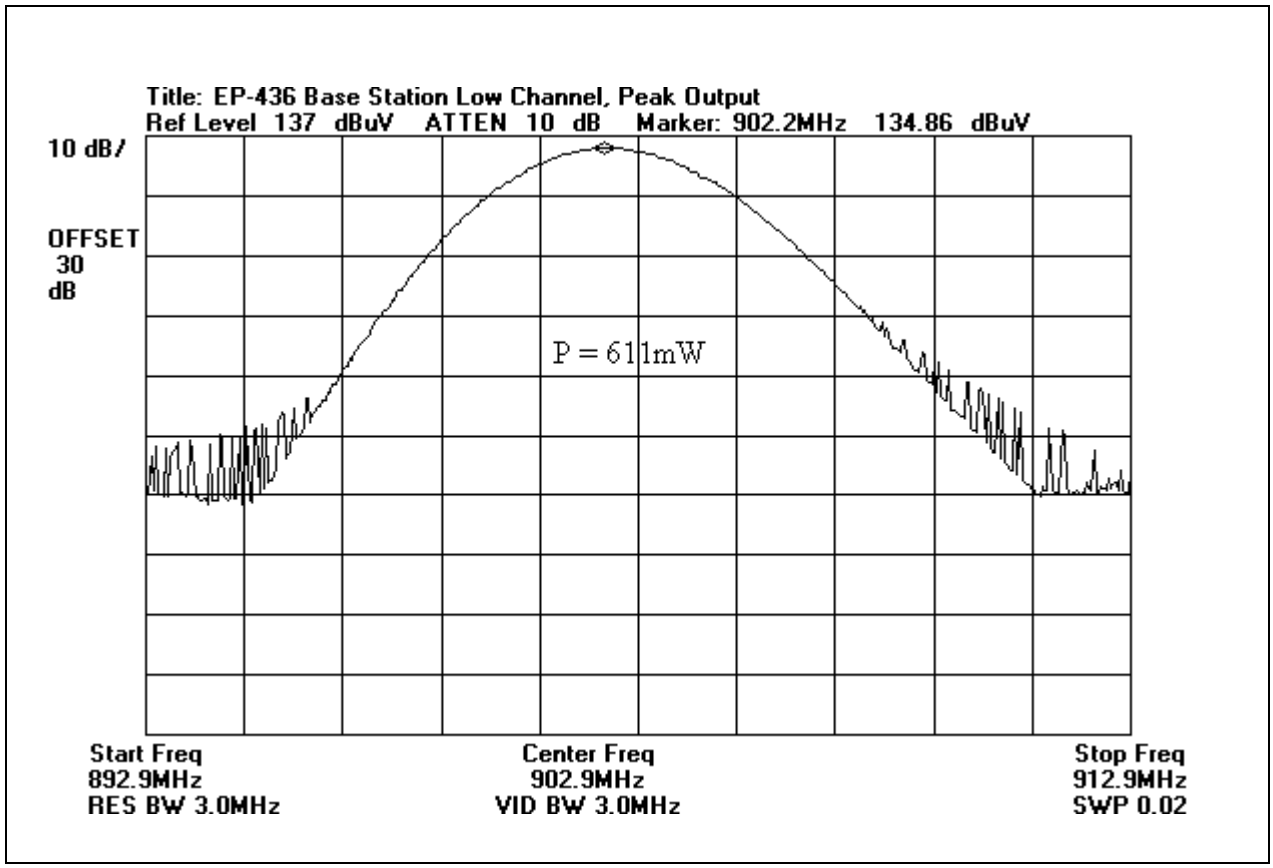
Table 6: 15.247(b)(2) Handset Highest Peak Output: EIRP									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Ant dB	Amp dB	Cable dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
901.950	108.6	24.9		1.2	-10.0	124.7	137.0	-12.3	V-1
902.000	109.3	24.9		1.2	-10.0	125.4	137.0	-11.6	H-1
902.000	109.2	24.9		1.2	-10.0	125.3	137.0	-11.7	H-1
914.750	109.0	24.9		1.2	-10.0	125.1	137.0	-11.9	H-2
914.950	108.7	24.9		1.2	-10.0	124.8	137.0	-12.2	H-2
915.030	108.3	24.9		1.2	-10.0	124.4	137.0	-12.6	V-3

Test Method: ANSI C63.4 (1992)
Spec Limit : FCC Part 15 Subpart C Section 15.247(b)(2)
Test Distance: 1 Meter

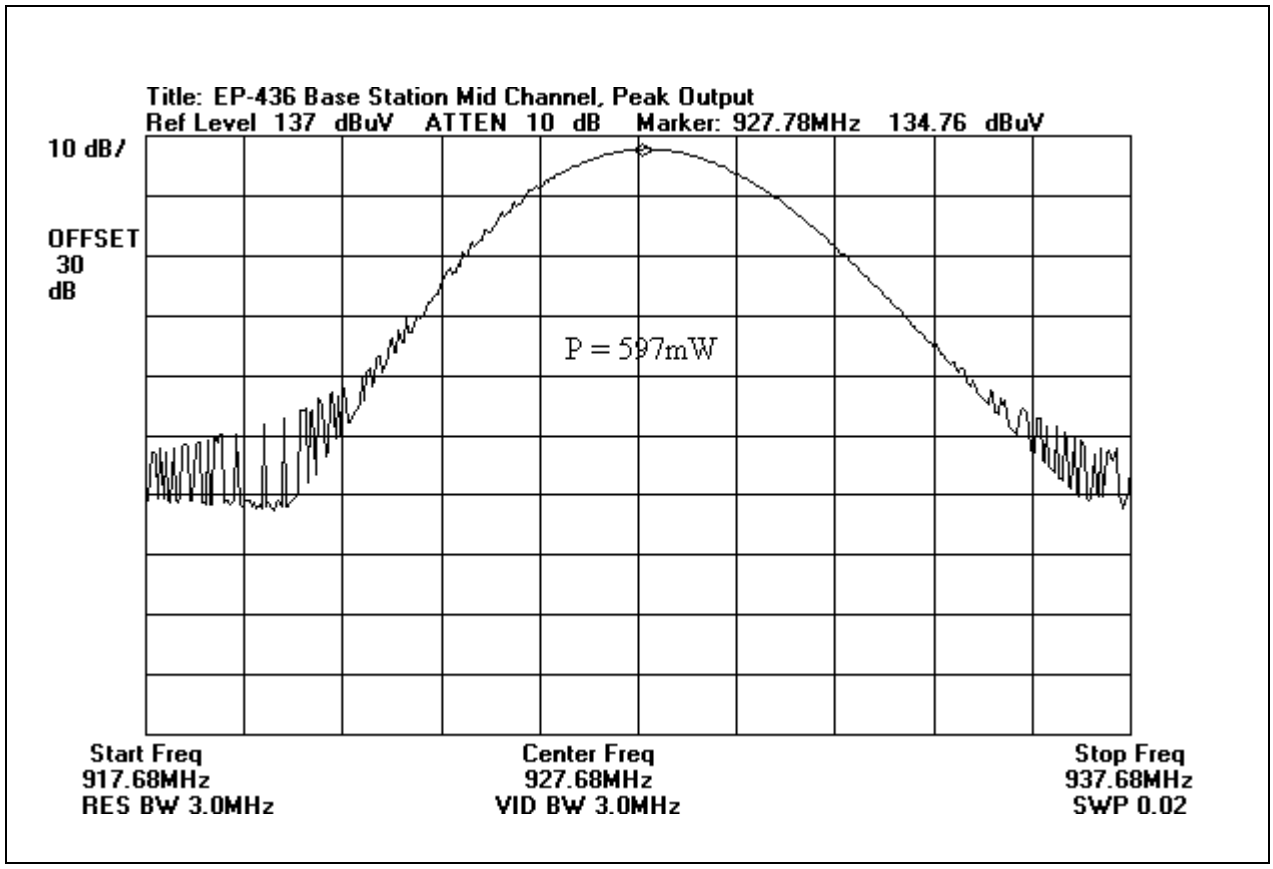
NOTES: H = Horizontal Polarization
V = Vertical Polarization
1 = Low Channel
2 = Middle Channel
3 = High Channel

COMMENTS: The channels are locked and are stepped through manually. The low channel = 902 MHz, mid channel = 915 MHz and high channel =928 MHz. Channel setting is as indicated for each reading in the datasheet. EUT tested in 3 orthogonal planes as indicated for each reading in the datasheet. 2 dBi gain antenna connected to the EUT. EUT is Battery operated. EIRP was calculated using the corrected reading in the datasheet less the distance correction factor and (EIRP) Peak power=(Ed)^2/30G. Calculated EIRP for the 6 highest readings are: 902 MHz, meter 109.3 dBuV + 26.1 dB = 135.4 dBuV = 0.729 Watt. 902 MHz, meter 109.2 dBuV + 26.1 dB = 135.3 dBuV = 0.713 Watt. 914 MHz, meter 109.0 dBuV + 26.1 dB = 135.1 dBuV = 0.681 Watt. 914 MHz. meter 108.7 dBuV + 26.1 dB = 134.8 dBuV = 0.635 Watt. 901 MHz meter 108.6 dBuV + 26.1 dB = 134.7 dBuV = 0.621 Watt. 928 MHz meter 108.2 dBuV + 26.1 dB = 134.4 dBuV = 0.579 Watt.

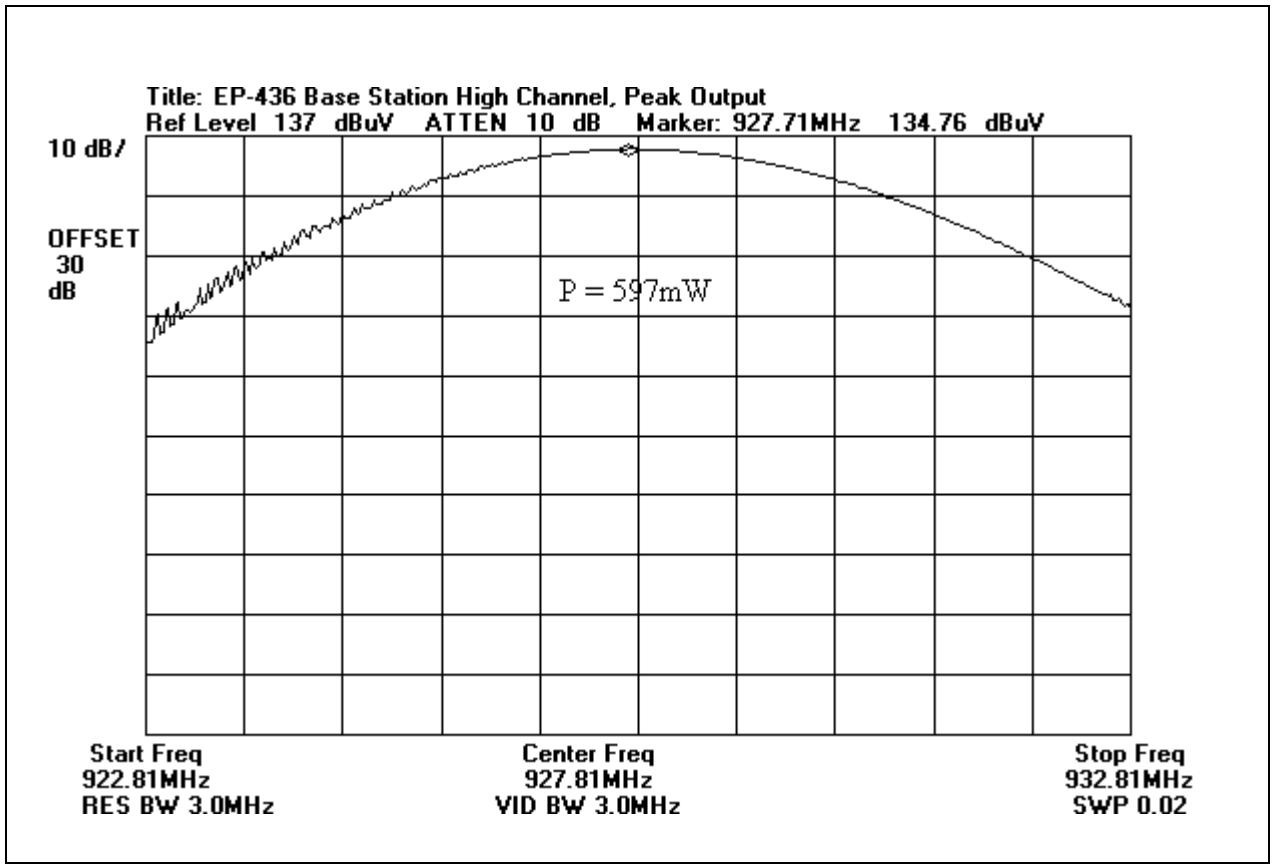
15.247(b)(2) BASE PEAK OUTPUT ANTENNA TERMINAL - LOW



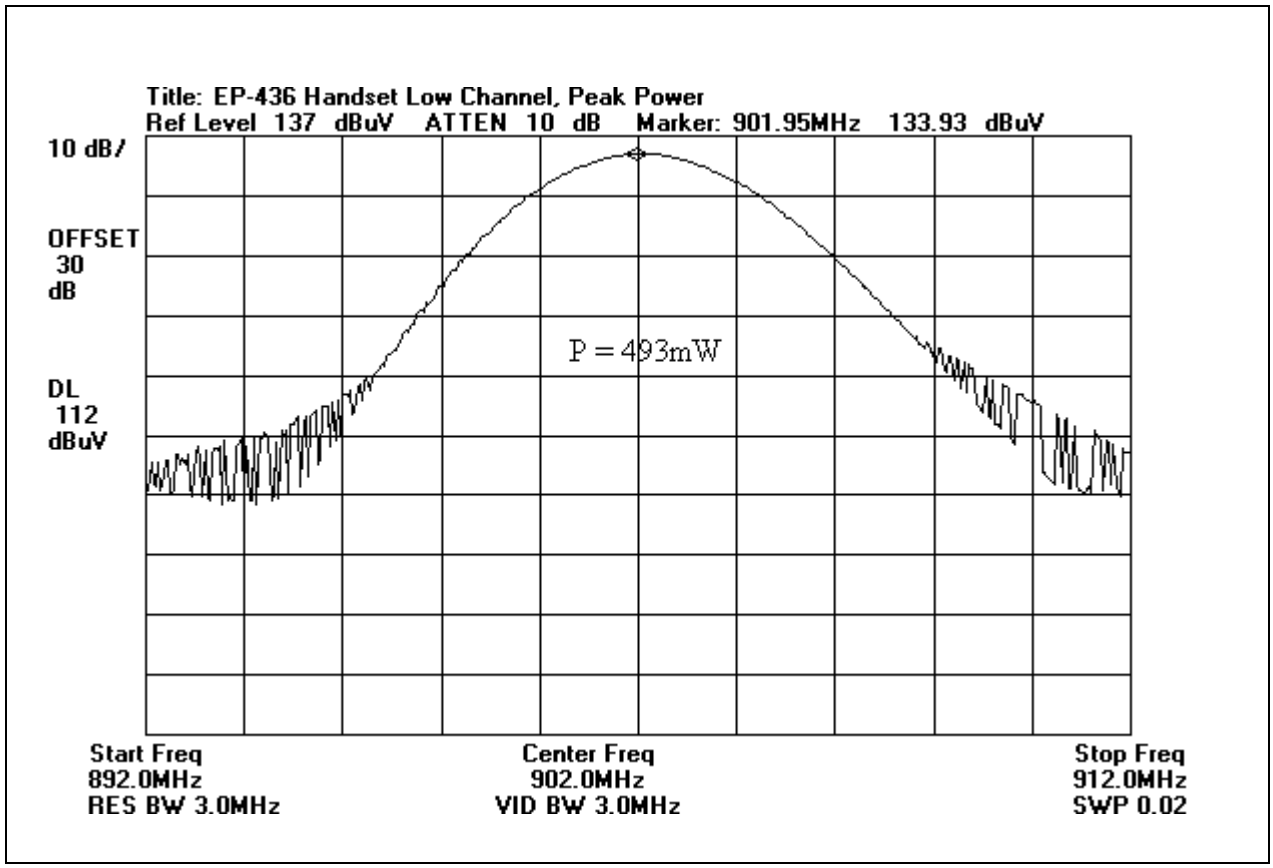
15.247(b)(2) BASE PEAK OUTPUT ANTENNA TERMINAL - MIDDLE



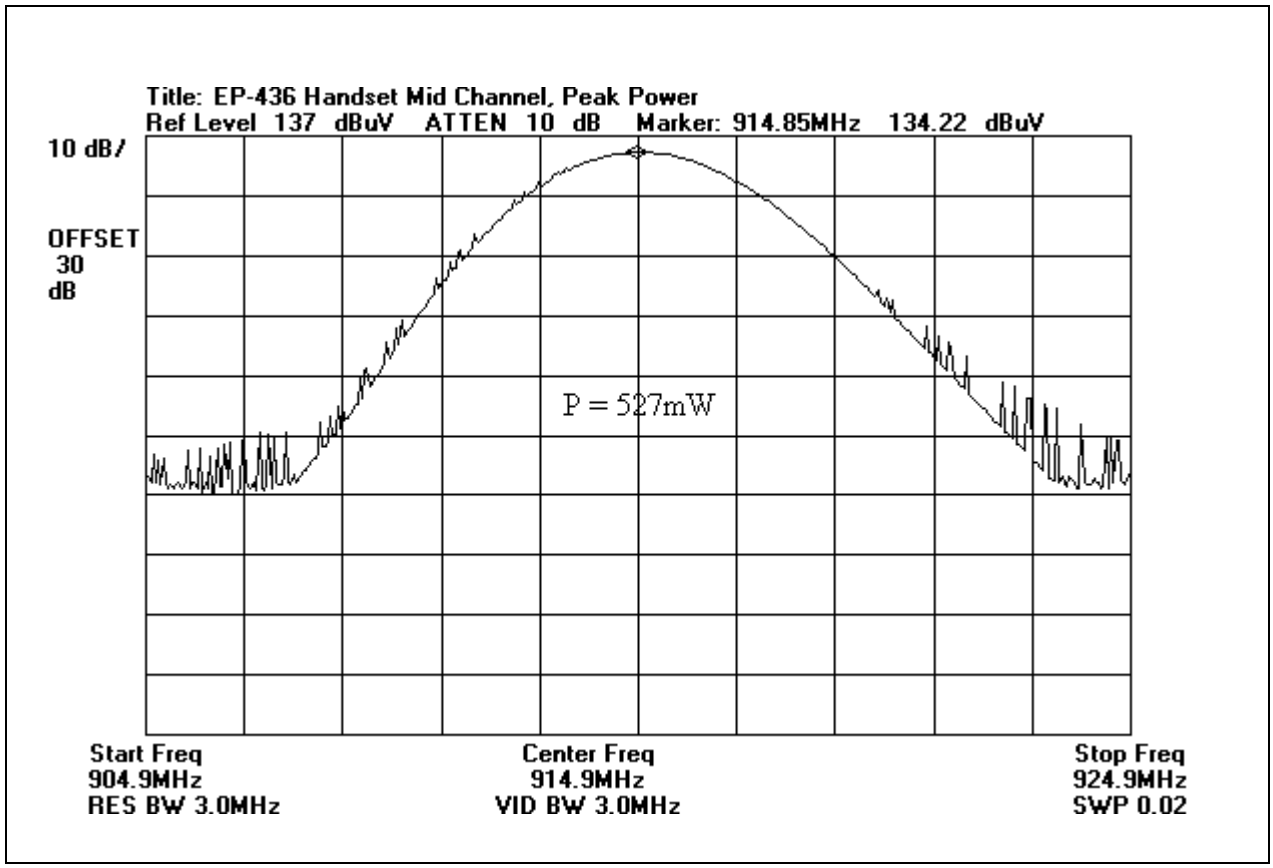
15.247(b)(2) BASE PEAK OUTPUT ANTENNA TERMINAL - HIGH



15.247(b)(2) HANDSET PEAK OUTPUT ANTENNA TERMINAL - LOW



15.247(b)(2) HANDSET PEAK OUTPUT ANTENNA TERMINAL - MIDDLE



15.247(b)(2) HANDSET PEAK OUTPUT ANTENNA TERMINAL - HIGH

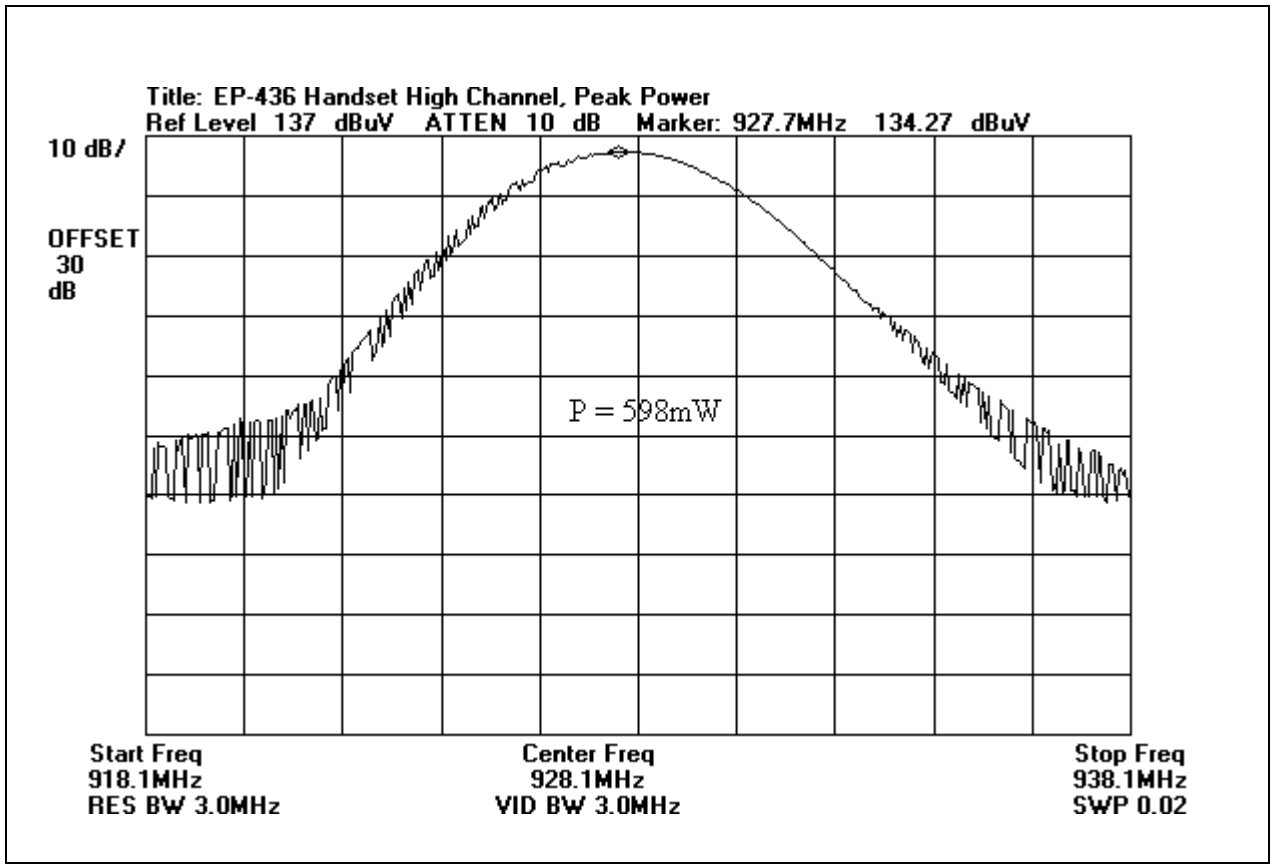


Table 7: 15.247(c)/15.209 Handset OATS Highest Emission Levels: 15MHz-10GHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Ant dB	Amp dB	Cable dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
963.523	35.0	25.1	0.0	1.2	-10.0	51.3	54.0	-2.7	VQ-2
1012.663	34.6	25.3	0.0	1.2	-10.0	51.1	54.0	-2.9	HA-1
1012.670	34.3	25.3	0.0	1.2	-10.0	50.8	54.0	-3.2	HA-1
1038.450	34.6	25.5	0.0	1.2	-10.0	51.3	54.0	-2.7	HA-3
4510.175	65.2	32.8	-40.0	3.3	-10.0	51.3	54.0	-2.7	H-1
4510.250	64.4	32.8	-40.0	3.3	-10.0	50.5	54.0	-3.5	V-1

Test Method: ANSI C63.4 (1992)
Spec Limit : FCC Part 15 Subpart C Section 15.247(c)/15.209
Test Distance: 1 and 3 Meters

NOTES:
H = Horizontal Polarization
V = Vertical Polarization
A = Average Reading
Q = Quasi Peak Reading
1 = Low Channel
2 = Middle Channel
3 = High Channel

COMMENTS: The channels are locked and are stepped through manually. The low channel = 902 MHz, mid channel = 915 MHz and high channel = 928 MHz. Channel setting is as indicated for each reading in the datasheet. EUT tested in 3 orthogonal planes as indicated for each reading in the datasheet. 2 dBi gain antenna connected to the EUT. EUT is Battery operated. Test distance is 1 meter 0.9 GHz to 10.0 GHz. Test distance is 3 meters 15 MHz to 900 MHz. Frequency range investigated was 15 MHz to 10 GHz (lowest oscillator = 15.38 MHz, highest oscillator = 928 MHz).

Table 8: 15.247(c)/15.209 Handset Terminal Highest Emission Levels: 9kHz-10GHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Ant dB	Amp dB	Cable dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
791.400	75.7	0.0				75.7	113.7	-38.0	N
589.920	74.7	0.0				74.7	113.7	-39.0	N
589.900	73.9	0.0				73.9	113.7	-39.8	N
1804.150	91.4	0.0				91.4	113.7	-22.3	N
1829.920	89.5	0.0				89.5	113.7	-24.2	N
1855.730	88.6	0.0				88.6	113.7	-25.1	N

Test Method: ANSI C63.4 (1992)
Spec Limit : FCC Part 15 Subpart C Section 15.247(c)

NOTES: N = No Polarization
1 = Low Channel
2 = Middle Channel
3 = High Channel

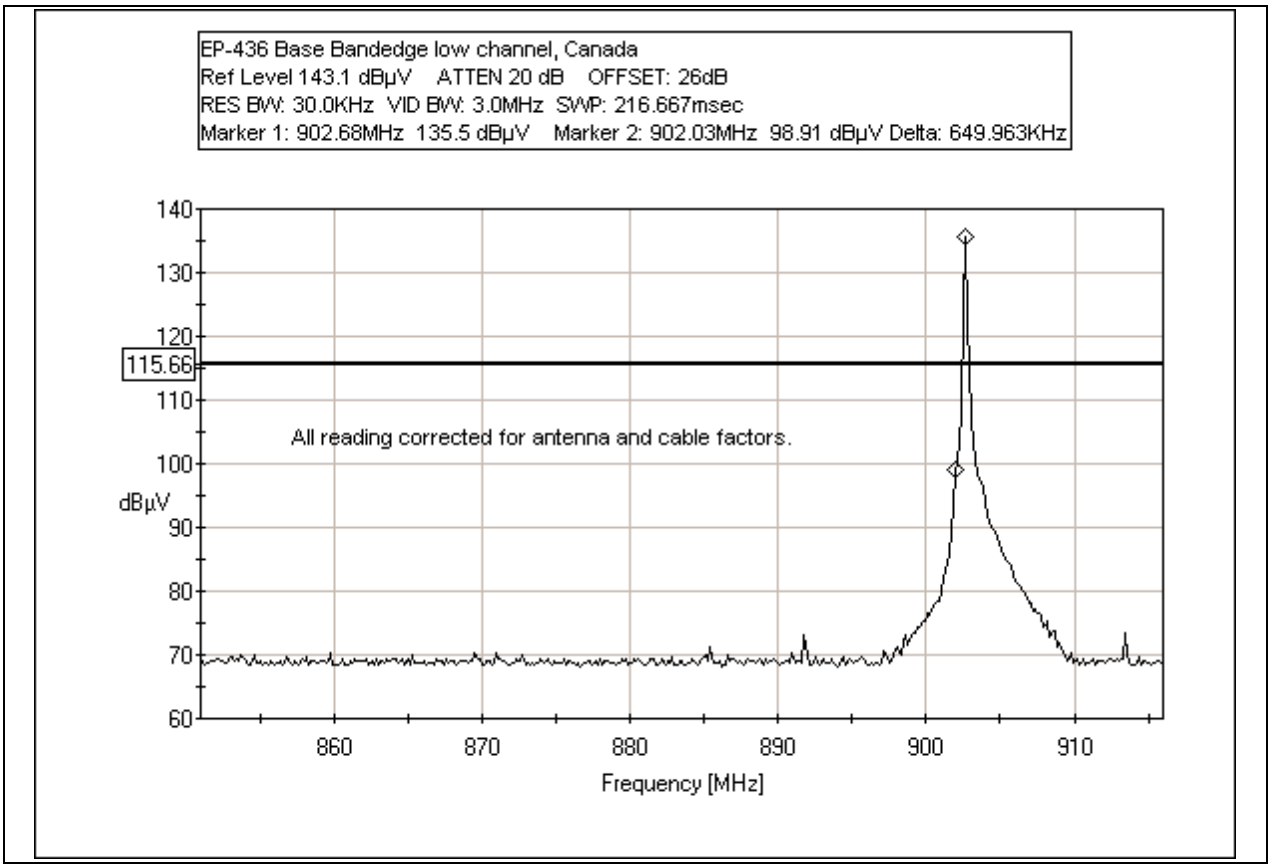
COMMENTS: Testing to show compliance of the EP-436 Handset to 47 CFR 15.247(c) conducted spurious emissions 9kHz - 10GHz. EP-436 Handset, conducted spurious emissions Check. Fundamentals are measured. The lowest strength fundamental - 20dB is then programmed as the limit line.

Table 9: 15.207 Handset Highest Conducted Emission Levels									
FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Lisn dB	dB	Cable dB	dB	CORRECTED READING dBµV	SPEC LIMIT dBµV	MARGIN dB	NOTES
27.055500	33.7	1.4		1.5		36.6	48.0	-11.4	B
27.504000	33.5	1.5		1.5		36.5	48.0	-11.5	B
28.050000	33.7	1.6		1.5		36.8	48.0	-11.2	B
28.869000	33.1	1.8		1.5		36.4	48.0	-11.6	B
29.298000	33.5	1.9		1.5		36.9	48.0	-11.1	B
29.844000	34.3	2.0		1.5		37.8	48.0	-10.2	B

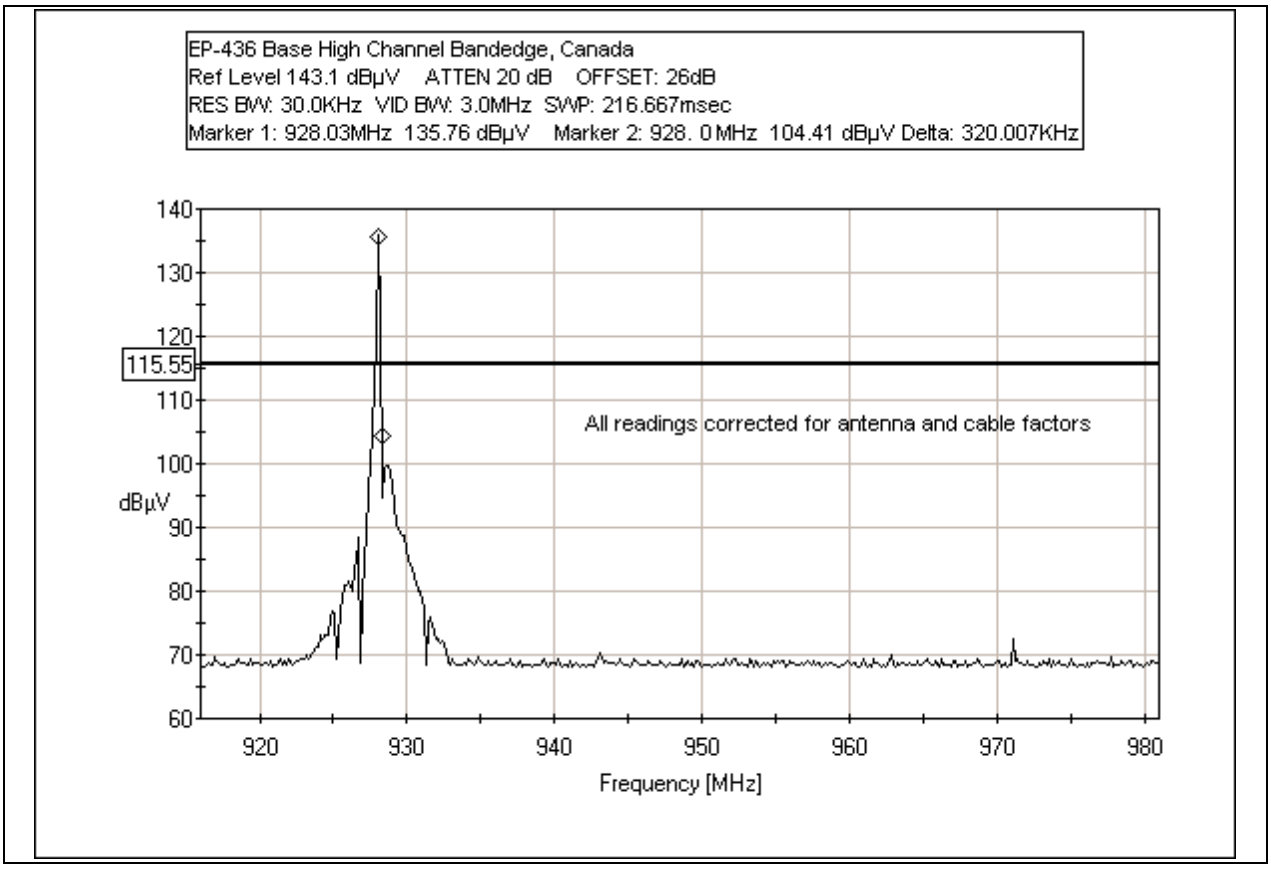
Test Method: ANSI C63.4 (1992) NOTES: B = Black Lead
Spec Limit : FCC Part 15 Subpart C Section 15.207

COMMENTS: The channels are locked and set to High Channel. EUT antenna is in the vertical position. 2 dBi gain antenna connected to the EUT. Base L-1 port is connected to the remote located CO Simulator via a 20 foot RJ-11 cable. L-2 through L-4 ports have unterminated 2 meter RJ 11 cables attached. Audio port is connected, via a 2 meter audio cable, to the CD Player which is playing a music CD. The EP-436 Handset is placed in the charger and is in the ring only mode. Frequency range investigated was 450 kHz to 30 MHz. Charger w/ Handset set connected to measurement LISN.

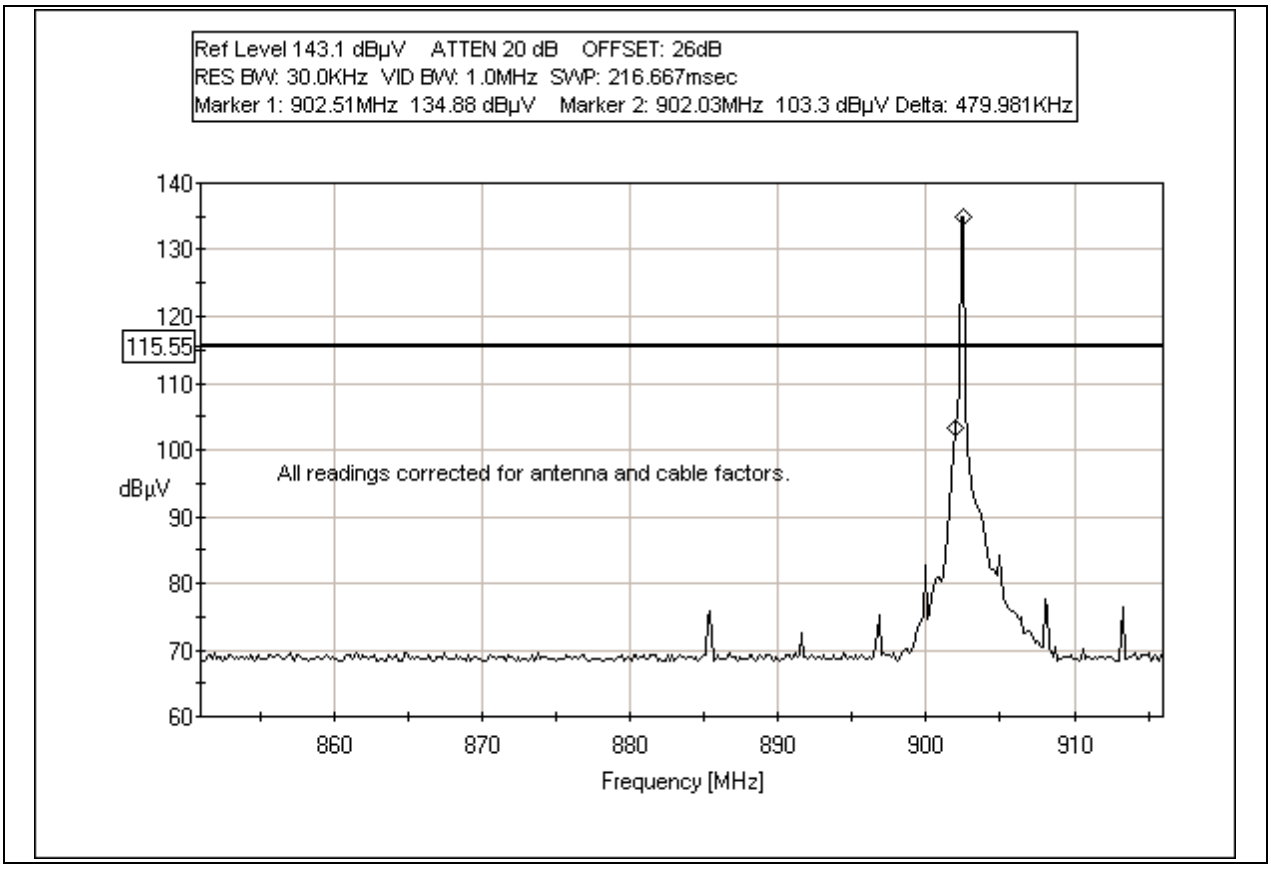
BASE BANDEDGE - LOW CHANNEL



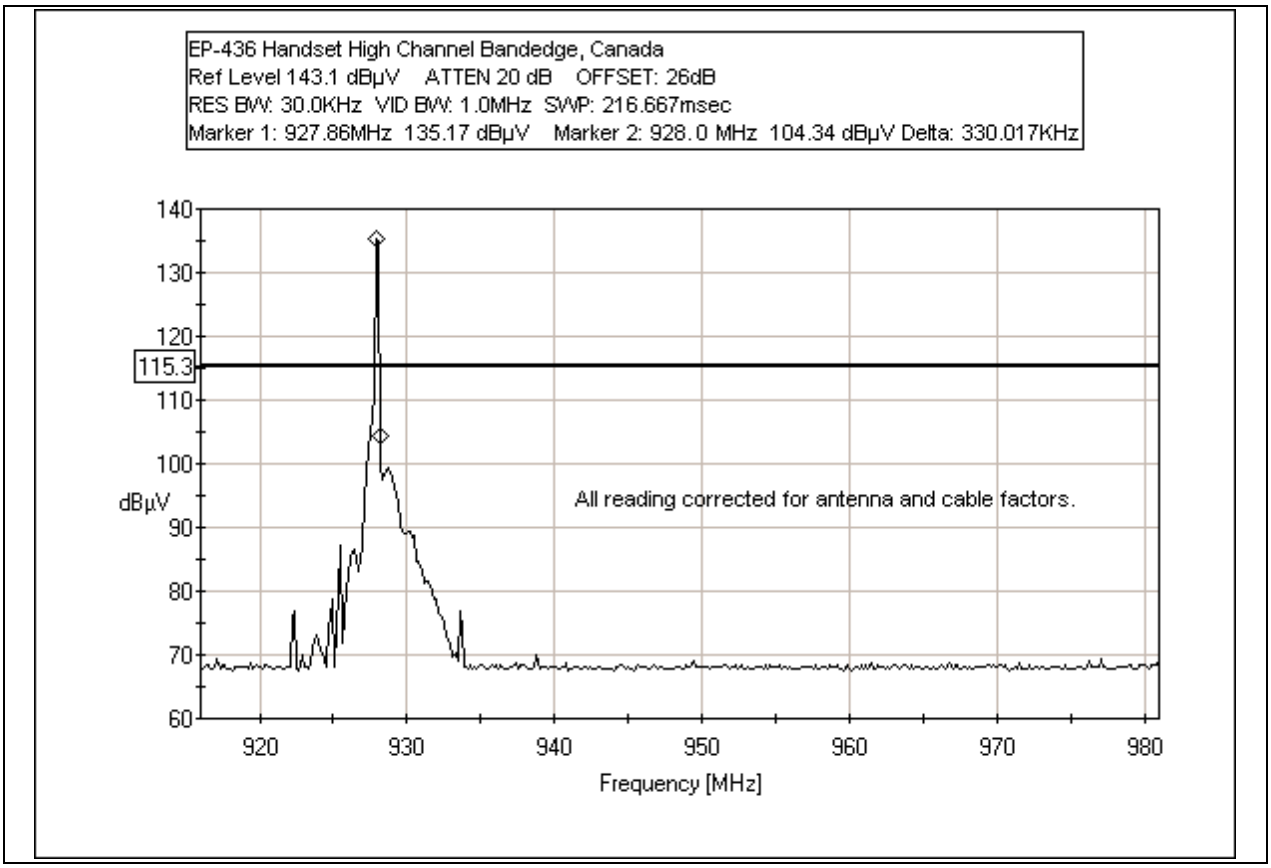
BASE BANDEDGE - HIGH CHANNEL



HANDSET BANDEDGE - LOW CHANNEL



HANDSET BANDEDGE - HIGH CHANNEL



MEASUREMENT UNCERTAINTY

Associated with data in this report is a ± 2.94dB measurement uncertainty for radiated emissions and ± 1.56dB for conducted emissions testing.

TEMPERATURE AND HUMIDITY DURING TESTING

The temperature during testing was within +15°C and + 35°C.
The relative humidity was between 20% and 75%.

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.

The radiated and conducted emissions data of the EP-436 4-Line Wireless Telephone System 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 Table A were used to collect both the radiated and conducted emissions data for the EP-436 4-Line Wireless Telephone System. For radiated measurements from 9 kHz to 30 MHz, the magnetic loop antenna was used. For radiated measurements between 30 - 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.

FCC SECTION 15.35:
TABLE B: ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE

TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	450 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
RADIATED EMISSIONS	1000 MHz	10 GHz	1 MHz

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 for the EP-436 4-Line Wireless Telephone System.

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.

For conducted emissions testing, a 30 to 50 second sweep time was used for automated measurements in the frequency bands of 450 kHz to 1.705 MHz, 1.705 MHz to 3 MHz, and 3 MHz to 30 MHz. All readings within 20 dB of the limit were recorded. At frequencies where the recorded emissions were close to the limit, further investigation was performed manually at a slower sweep rate.

Antenna Conducted Emissions

For measuring the signal strength on the RF output port of the EUT, the spectrum analyzer was connected directly to the EUT. The sweep time of the analyzer was adjusted so that the spectrum analyzer readings were always in a calibrated range. All readings within 20 dB of the limit were recorded.

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. For frequencies exceeding 1000 MHz, the horn antenna was used. 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 and configuration of EUT. Maximizing of the EUT was achieved by monitoring the spectrum analyzer on a closed circuit television monitor. Photographs showing the final worst case configuration of the EUT are contained in Appendix A.

TRANSMITTER CHARACTERISTICS

15.247(a)(1)(i) Bandwidth Measurements (Frequency Hopping 902-928 MHz)

The fundamental frequency was kept within the permitted band 902-928MHz. The hopping channel carrier frequencies shall be separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. If the 20 dB bandwidth of the hopping channel is less than 250 kHz in the range 902-928 MHz, the system shall use at least 50 hopping frequencies and the average dwell time on any frequency shall not be greater than 0.4 seconds within a 20 second period.

15.247(b) Peak Output Power

The RF conducted test was measured using a direct connection between the antenna port of the transmitter and the spectrum analyzer, through suitable attenuation. The resolution bandwidth was adjusted to greater than the 6 dB bandwidth of the emissions.

> **15.247 (b)(2)** For the frequency hopping band of 902-928 MHz, the power shall not exceed 1 watt for systems employing at least 50 hopping channels, 0.25 watts for less than 50 channels but at least 25 channels, as permitted under paragraph (a)(1)(I) of section 15.247.

APPENDIX A

TEST SETUP PHOTOGRAPHS

PHOTOGRAPH SHOWING ANTENNA CONDUCTED EMISSIONS - BASE

Antenna Conducted - Base

PHOTOGRAPH SHOWING ANTENNA CONDUCTED EMISSIONS - HANDSET

Antenna Conducted - Handset

PHOTOGRAPH SHOWING RADIATED EMISSIONS - BASE & CHARGER

Front View of Base and Charger

PHOTOGRAPH SHOWING RADIATED EMISSIONS - BASE & CHARGER

Rear View of Base and Charger

PHOTOGRAPH SHOWING RADIATED EMISSIONS - HANDSET

Handset in Vertical Position - Back View

PHOTOGRAPH SHOWING RADIATED EMISSIONS - HANDSET

Handset in Vertical Position - Front View

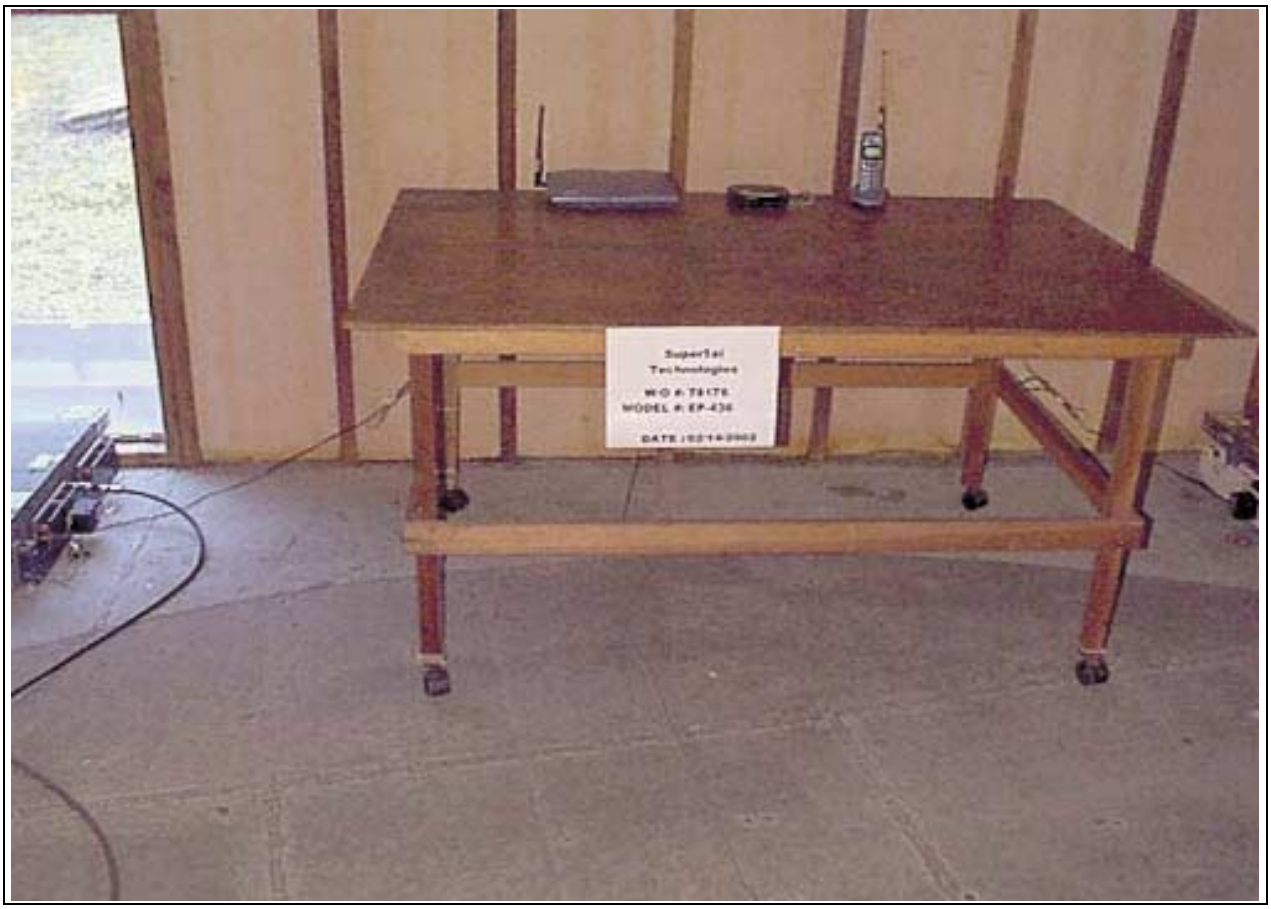
PHOTOGRAPH SHOWING RADIATED EMISSIONS - HANDSET

Handset in Horizontal Side Position

PHOTOGRAPH SHOWING RADIATED EMISSIONS - HANDSET

Handset in Horizontal Position

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS - BASE & HANDSET



Mains Conducted Emissions - Front View

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS - BASE & HANDSET

Mains Conducted Emissions - Side View

APPENDIX B

TEST EQUIPMENT LIST

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 84300-80037 1.5 GHz High Pass Filter	3643A00027	06/08/2001	06/08/2002	2116
HP 84300-80038 3.5 GHz High Pass Filter	3643A00027	06/08/2001	06/08/2002	2117
HP 8593EM EMC Analyzer	3624A00159	09/21/2001	09/21/2002	2111
EMCO 3115 1-18 GHz Horn Antenna	9006-3413	08/07/2001	06/07/2002	327
HP 83017A Amplifier 26GHz	0000009002	01/15/2002	01/15/2003	2114
EMCO 6502 Mag Loop Antenna	2156	01/09/2002	01/09/2003	52
Chase CBL6111C Bilog Antenna	2455	01/31/2002	01/31/2003	1992
HP 8447D Amplifier	2727A05392	08/17/2001	08/17/2002	10
HP 84125-80008 18-26 GHz Horn Antenna	3643A00027	07/09/2001	07/09/2002	2112
HP 8574A EMI Receiver	3010A01076	07/12/2001	07/12/2002	42
Fischer LISN	none	11/15/2001	11/15/2002	14
Fischer LISN	none	11/15/2001	11/15/2002	13
Fischer LISN	none	11/15/2001	11/15/2002	12
Fischer LISN	none	11/15/2001	11/15/2002	11
HP QP Adapter	2811A01267	11/09/2001	11/09/2002	478
HP Display	2403A08241	11/09/2001	11/09/2002	489
HP Spectrum Analyzer	2209A01404	11/09/2001	11/09/2002	490

APPENDIX C

Test Location: CKC Laboratories •22105 Wilson River Hwy. • Tillamook, OR 97141 • 503 842-5577

Customer: **SuperTel Technologies, Inc.**
Specification: **FCC15.247**
Work Order #: **78176** Date: 2/8/02
Test Type: **Radiated Scan** Time: 12:12:44
Equipment: **900 MHz 4-Line WPABX** Sequence#: 5
Manufacturer: SuperTel Technologies Tested By: Mike Wilkinson
Model: EP-436 Base Set
S/N: ENG-1

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

Function	Manufacturer	Model #	S/N
Power Supply	SENAO	AM-71000	None
900 MHz 4-Line WPABX*	SuperTel Technologies	EP-436 Base Set	ENG-1

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

The channels are locked and are stepped through manually. The low channel = 902 MHz, mid channel = 915 MHz and high channel = 928 MHz. Channel setting is as indicated for each reading in the datasheet. 2 dBi gain antenna connected to the EUT. EUT antenna is in the vertical position EIRP was calculated using the corrected reading in the datasheet less the distance correction factor and (EIRP)Peak power=(Ed)^2/30G. Calculated EIRP for the readings are: 928 MHz vertical, meter 109.9 + 26.2 = 136.1 dBuV = 0.856 Watt. 915 MHz vertical, meter 109.9 + 26.1 = 136.0 dBuv = 0.837 Watt. 902 MHz Vertical, meter 109.4 + 26.1 = 135.5 dBuv = 0.746 Watt. 928 MHz horizontal, meter 99.1 + 26.2 = 125.3 dBuV = 0.072 Watt. 915 MHz horizontal, meter 98.8 + 26.1 = 124.9 dBuV = 0.065 Watt. 902 MHz horizontal, meter 97.7 + 26.1 + 123.8 dBuV = 0.050 Watt.

Transducer Legend:

T1=Horn 1-18	T2=10' Silver Semflex SMA CKC P1403

Measurement Data: Reading listed by margin. Test Distance: 1 Meter

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	927.770M	109.9	+25.0	+1.2			-10.0	126.1	137.0	-10.9	Vert
									High channel		
2	915.020M	109.9	+24.9	+1.2			-10.0	126.0	137.0	-11.0	Vert
									Mid channel		
3	902.250M	109.4	+24.9	+1.2			-10.0	125.5	137.0	-11.5	Vert
									Low channel		
4	927.700M	99.1	+25.0	+1.2			-10.0	115.3	137.0	-21.7	Horiz
									High channel		
5	915.200M	98.8	+24.9	+1.2			-10.0	114.9	137.0	-22.1	Horiz
									Mid channel		
6	902.250M	97.7	+24.9	+1.2			-10.0	113.8	137.0	-23.2	Horiz
									Low channel		

Test Location: CKC Laboratories •22105 Wilson River Hwy. • Tillamook,OR 97141 • 503 842-5577

Customer: **SuperTel Technologies, Inc.**
Specification: **FCC15.247 & 15.209 @ 0meter**
Work Order #: **78247** Date: 2/12/02
Test Type: **Radiated Scan** Time: 09:16:45
Equipment: **900 MHz 4-Line WPABX** Sequence#: 4
Manufacturer: SuperTel Technologies Tested By: Mike Wilkinson
Model: EP-436 Base Set
S/N: ENG-1

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

Function	Manufacturer	Model #	S/N
Power Supply	SENAO	AM-71000	None
900 MHz 4-Line WPABX*	SuperTel Technologies	EP-436 Base Set	ENG-1

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

The channels are locked and are stepped through manually. The low channel = 902 MHz, mid channel = 915 MHz and high channel =928 MHz. Channel setting is as indicated for each reading in the datasheet. AC power input was set to 102 VAC (85%), 120 VAC (nominal) and 138 VAC (115%) for each channel as indicated for each reading in the datasheet. EUT is connected directly to the Spectrum Analyzer through a 30 dB attenuator. Highest output was 135.6 dBuV = 0.724 Watt.

Transducer Legend:

T1=30 dB Pad

Measurement Data: Reading listed by margin. Test Distance: None

#	Freq MHz	Rdng dBµV	T1 dB	dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	915.030M	105.4	+30.2				+0.0	135.6	137.0	-1.4	None
									85%, mid channel		
2	902.100M	105.4	+30.2				+0.0	135.6	137.0	-1.4	None
									85%, low channel		
3	915.000M	105.3	+30.2				+0.0	135.5	137.0	-1.5	None
									115%, mid channel		
4	915.000M	105.3	+30.2				+0.0	135.5	137.0	-1.5	None
									Nominal, mid channel		
5	902.130M	105.3	+30.2				+0.0	135.5	137.0	-1.5	None
									115%, low channel		
6	902.130M	105.3	+30.2				+0.0	135.5	137.0	-1.5	None
									Nominal, low channel		
7	927.680M	105.2	+30.2				+0.0	135.4	137.0	-1.6	None
									Nominal, high channel		
8	927.680M	105.1	+30.2				+0.0	135.3	137.0	-1.7	None
									85%, high channel		
9	927.680M	105.1	+30.2				+0.0	135.3	137.0	-1.7	None
									115%, high channel		

Test Location: CKC Laboratories •22105 Wilson River Hwy. • Tillamook,OR 97141 • 503 842-5577

Customer: **SuperTel Technologies, Inc.**
Specification: **FCC15.247 & 15.209**
Work Order #: **78176** Date: 2/14/02
Test Type: **Radiated Scan** Time: 14:51:39
Equipment: **900 MHz 4-Line WPABX** Sequence#: 6
Manufacturer: SuperTel Technologies Tested By: Mike Wilkinson
Model: EP-436 Base Set
S/N: ENG-1

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

Function	Manufacturer	Model #	S/N
900 MHz 4-Line WPABX	SuperTel Technologies	EP-436 Hand Set	ENG-1
900 MHz 4-Line WPABX*	SuperTel Technologies	EP-436 Base Set	ENG-1
900 MHz 4-Line WPABX	SuperTel Technologies	EP-436 Hand Set	ENG-1
Battery Charger	SuperTel Technologies	ENG-CH	None

Support Devices:

Function	Manufacturer	Model #	S/N
CD Player	Sony	D-131	5658402
Remote CO Simulator	Teltone	TLS-5	029081

Test Conditions / Notes:

The channels are locked and are stepped through manually. The low channel = 902 MHz, mid channel = 915 MHz and high channel =928 MHz. Channel setting is as indicated for each reading in the datasheet. EUT antenna is in the vertical position. 2 dBi gain antenna connected to the EUT. Base L-1 port is connected to the remote located CO Simulator via a 20 foot RJ-11 cable. L-2 through L-4 ports have unterminated 2 meter RJ 11 cables attached. Audio port is connected, via a 2 meter audio cable, to the CD Player which is playing a music CD. The EP-436 Handset is placed in the charger and is in the ring only mode. Test distance is 1 meter 0.9 GHz to 10.0 GHz. Test distance is 3 meters 15 MHz to 900 MHz. Frequency range investigated was 3 MHz to 10 GHz (lowest oscillator = 3.579 MHz, highest oscillator = 928 MHz).

Transducer Legend:

T1=26.5 GHz Amp	T2=6in SMA cable #2212
T3=Bilog A	T4=Amp-A
T5=10' Silver Semflex SMA CKC P1403	T6=Horn 1-18
T7=1.5 GHz HPF	

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

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7						
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	791.596M	50.4	+0.0	+0.0	+21.8	-27.9	+0.0	44.3	46.0	-1.7	Vert
	QP		+0.0	+0.0	+0.0				Low channel		
^	791.600M	52.9	+0.0	+0.0	+21.8	-27.9	+0.0	46.8	46.0	+0.8	Vert
			+0.0	+0.0	+0.0				Low channel		
3	1038.350M	53.3	+0.0	+0.0	+24.3	-27.3	+0.0	50.3	54.0	-3.7	Vert
	Ave		+0.0	+0.0	+0.0				High channel		
^	1038.350M	72.5	+0.0	+0.0	+24.3	-27.3	+0.0	69.5	54.0	+15.5	Vert
			+0.0	+0.0	+0.0				High channel		
5	817.180M	47.0	+0.0	+0.0	+22.1	-27.8	+0.0	41.3	46.0	-4.7	Vert
	QP		+0.0	+0.0	+0.0				High channel		
^	817.180M	49.9	+0.0	+0.0	+22.1	-27.8	+0.0	44.2	46.0	-1.8	Vert
			+0.0	+0.0	+0.0						

									High channel		
7	7320.703M	58.6	-38.0	+0.3	+0.0	+0.0	-10.0	48.9	54.0	-5.1	Vert
			+3.3	+34.5	+0.2				Mid channel		
8	1804.447M	69.2	-42.0	+0.2	+0.0	+0.0	-10.0	48.7	54.0	-5.3	Vert
	Ave		+1.6	+29.0	+0.7				Low channel		
^	1804.447M	87.1	-42.0	+0.2	+0.0	+0.0	-10.0	66.6	54.0	+12.6	Vert
			+1.6	+29.0	+0.7				Low channel		
10	4639.127M	62.0	-40.0	+0.3	+0.0	+0.0	-10.0	48.3	54.0	-5.7	Vert
			+2.7	+33.0	+0.3				High channel		
11	6315.542M	58.0	-39.0	+0.4	+0.0	+0.0	-10.0	47.0	54.0	-7.0	Vert
			+3.1	+34.4	+0.1				Low channel		
12	1012.745M	49.6	+0.0	+0.0	+24.1	-27.4	+0.0	46.3	54.0	-7.7	Vert
	Ave		+0.0	+0.0	+0.0				Low channel		
^	1012.745M	61.2	+0.0	+0.0	+24.1	-27.4	+0.0	57.9	54.0	+3.9	Vert
			+0.0	+0.0	+0.0				Low channel		
14	6494.743M	56.2	-38.5	+0.4	+0.0	+0.0	-10.0	45.8	54.0	-8.2	Vert
			+3.1	+34.5	+0.1				High channel		
15	2783.635M	63.3	-41.0	+0.2	+0.0	+0.0	-10.0	45.2	54.0	-8.8	Horiz
	Ave		+2.0	+30.4	+0.3				High channel		
^	2783.635M	76.5	-41.0	+0.2	+0.0	+0.0	-10.0	58.4	54.0	+4.4	Horiz
			+2.0	+30.4	+0.3				High channel		
17	6405.703M	56.2	-39.0	+0.4	+0.0	+0.0	-10.0	45.2	54.0	-8.8	Vert
			+3.1	+34.4	+0.1				Mid channel		
18	7422.643M	54.1	-38.0	+0.3	+0.0	+0.0	-10.0	44.5	54.0	-9.5	Vert
			+3.3	+34.6	+0.2				High channel		
19	2745.250M	62.7	-41.0	+0.2	+0.0	+0.0	-10.0	44.4	54.0	-9.6	Vert
	Ave		+2.0	+30.2	+0.3				Mid channel		
^	2745.250M	76.7	-41.0	+0.2	+0.0	+0.0	-10.0	58.4	54.0	+4.4	Vert
			+2.0	+30.2	+0.3				Mid channel		
21	3608.847M	58.4	-39.0	+0.3	+0.0	+0.0	-10.0	44.4	54.0	-9.6	Vert
	Ave		+2.3	+32.0	+0.4				Low channel		
^	3608.847M	70.2	-39.0	+0.3	+0.0	+0.0	-10.0	56.2	54.0	+2.2	Vert
			+2.3	+32.0	+0.4				Low channel		
23	5567.028M	56.0	-39.0	+0.3	+0.0	+0.0	-10.0	44.2	54.0	-9.8	Vert
			+2.9	+33.9	+0.1				High channel		
24	5490.702M	55.7	-39.0	+0.4	+0.0	+0.0	-10.0	43.9	54.0	-10.1	Vert
			+2.9	+33.8	+0.1				Mid channel		
25	1025.400M	46.8	+0.0	+0.0	+24.2	-27.3	+0.0	43.7	54.0	-10.3	Vert
	Ave		+0.0	+0.0	+0.0				Mid channel		
^	1025.400M	69.7	+0.0	+0.0	+24.2	-27.3	+0.0	66.6	54.0	+12.6	Vert
			+0.0	+0.0	+0.0				Mid channel		
27	2783.498M	61.7	-41.0	+0.2	+0.0	+0.0	-10.0	43.6	54.0	-10.4	Vert
	Ave		+2.0	+30.4	+0.3				High channel		
^	2783.498M	82.6	-41.0	+0.2	+0.0	+0.0	-10.0	64.5	54.0	+10.5	Vert
			+2.0	+30.4	+0.3				High channel		
29	1830.250M	63.8	-42.0	+0.2	+0.0	+0.0	-10.0	43.3	54.0	-10.7	Vert
	Ave		+1.7	+29.0	+0.6				Mid channel		
^	1830.250M	86.1	-42.0	+0.2	+0.0	+0.0	-10.0	65.6	54.0	+11.6	Vert
			+1.7	+29.0	+0.6				Mid channel		
31	8350.542M	49.9	-37.0	+0.2	+0.0	+0.0	-10.0	43.0	54.0	-11.0	Vert
			+3.6	+35.8	+0.5				High channel		

32	1855.597M	63.4	-42.0	+0.2	+0.0	+0.0	-10.0	42.9	54.0	-11.1	Vert
	Ave		+1.7	+29.0	+0.6				High channel		
^	1855.597M	86.5	-42.0	+0.2	+0.0	+0.0	-10.0	66.0	54.0	+12.0	Vert
			+1.7	+29.0	+0.6				High channel		
34	8235.702M	50.0	-37.0	+0.2	+0.0	+0.0	-10.0	42.7	54.0	-11.3	Vert
			+3.5	+35.6	+0.4				Mid channel		
35	3711.227M	56.1	+0.0	+0.0	+0.0	+0.0	-10.0	42.2	54.0	-11.8	Vert
	Ave		+0.0	+0.0	+0.0				High channel		
^	3711.227M	75.6	-39.0	+0.3	+0.0	+0.0	-10.0	61.7	54.0	+7.7	Vert
			+2.4	+32.0	+0.4				High channel		
37	1804.542M	61.7	-42.0	+0.2	+0.0	+0.0	-10.0	41.2	54.0	-12.8	Horiz
	Ave		+1.6	+29.0	+0.7				Low channel		
^	1804.542M	73.8	-42.0	+0.2	+0.0	+0.0	-10.0	53.3	54.0	-0.7	Horiz
			+1.6	+29.0	+0.7				Low channel		
39	2706.742M	59.2	-41.0	+0.2	+0.0	+0.0	-10.0	40.9	54.0	-13.1	Horiz
	Ave		+2.0	+30.1	+0.4				Low channel		
^	2706.742M	68.0	-41.0	+0.2	+0.0	+0.0	-10.0	49.7	54.0	-4.3	Horiz
			+2.0	+30.1	+0.4				Low channel		
41	2706.647M	59.1	-41.0	+0.2	+0.0	+0.0	-10.0	40.8	54.0	-13.2	Vert
	Ave		+2.0	+30.1	+0.4				Low channel		
^	2706.647M	72.8	-41.0	+0.2	+0.0	+0.0	-10.0	54.5	54.0	+0.5	Vert
			+2.0	+30.1	+0.4				Low channel		
43	7217.742M	50.1	-38.0	+0.3	+0.0	+0.0	-10.0	40.1	54.0	-13.9	Vert
	Ave		+3.3	+34.3	+0.1				Low channel		
^	7217.742M	59.9	-38.0	+0.3	+0.0	+0.0	-10.0	49.9	54.0	-4.1	Vert
			+3.3	+34.3	+0.1				Low channel		
45	4511.143M	53.4	-40.0	+0.4	+0.0	+0.0	-10.0	39.5	54.0	-14.5	Vert
	Ave		+2.6	+32.8	+0.3				Low channel		
^	4511.143M	62.8	-40.0	+0.4	+0.0	+0.0	-10.0	48.9	54.0	-5.1	Vert
			+2.6	+32.8	+0.3				Low channel		
47	8119.943M	47.1	-37.4	+0.2	+0.0	+0.0	-10.0	39.2	54.0	-14.8	Vert
	Ave		+3.5	+35.4	+0.4				Low channel		
^	8119.943M	60.9	-37.4	+0.2	+0.0	+0.0	-10.0	53.0	54.0	-1.0	Vert
			+3.5	+35.4	+0.4				Low channel		
49	294.870M	44.4	+0.0	+0.0	+13.1	-26.4	+0.0	31.1	46.0	-14.9	Vert
			+0.0	+0.0	+0.0				Low channel		
50	3711.248M	51.5	-39.0	+0.3	+0.0	+0.0	-10.0	37.6	54.0	-16.4	Horiz
	Ave		+2.4	+32.0	+0.4				High channel		
^	3711.248M	71.0	-39.0	+0.3	+0.0	+0.0	-10.0	57.1	54.0	+3.1	Horiz
			+2.4	+32.0	+0.4				High channel		
52	1830.365M	57.8	-42.0	+0.2	+0.0	+0.0	-10.0	37.3	54.0	-16.7	Horiz
	Ave		+1.7	+29.0	+0.6				Mid channel		
^	1830.365M	75.1	-42.0	+0.2	+0.0	+0.0	-10.0	54.6	54.0	+0.6	Horiz
			+1.7	+29.0	+0.6				Mid channel		
54	4575.250M	50.4	-40.0	+0.3	+0.0	+0.0	-10.0	36.6	54.0	-17.4	Vert
	Ave		+2.7	+32.9	+0.3				Mid channel		
^	4575.250M	63.5	-40.0	+0.3	+0.0	+0.0	-10.0	49.7	54.0	-4.3	Vert
			+2.7	+32.9	+0.3				Mid channel		

56	3660.250M	50.3	-39.0	+0.3	+0.0	+0.0	-10.0	36.3	54.0	-17.7	Vert
	Ave		+2.3	+32.0	+0.4				Mid channel		
^	3660.250M	62.3	-39.0	+0.3	+0.0	+0.0	-10.0	48.3	54.0	-5.7	Vert
			+2.3	+32.0	+0.4				Mid channel		
58	1855.735M	56.1	-42.0	+0.2	+0.0	+0.0	-10.0	35.6	54.0	-18.4	Horiz
	Ave		+1.7	+29.0	+0.6				High channel		
^	1855.735M	71.5	-42.0	+0.2	+0.0	+0.0	-10.0	51.0	54.0	-3.0	Horiz
			+1.7	+29.0	+0.6				High channel		
60	2745.365M	53.6	-41.0	+0.2	+0.0	+0.0	-10.0	35.3	54.0	-18.7	Horiz
	Ave		+2.0	+30.2	+0.3				Mid channel		
^	2745.365M	67.5	-41.0	+0.2	+0.0	+0.0	-10.0	49.2	54.0	-4.8	Horiz
			+2.0	+30.2	+0.3				Mid channel		

Test Location: CKC Laboratories •5473A Clouds Rest. • Mariposa, CA 95338 • 209-966-4257

Customer: **SuperTel**
Specification: **FCC15.247(c) EP-436 Base**
Work Order #: **78247** Date: 2/25/02
Test Type: **Antenna Conducted Spurious Emissions** Time: 16:09:34
Equipment: **4 Line WPABX Base Station** Sequence#: 1
Manufacturer: SuperTel Tested By: Randal Clark
Model: EP-436
S/N: none

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

Function	Manufacturer	Model #	S/N
4 Line WPABX Base Station*	SuperTel	EP-436	none

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Testing to show compliance of the EP-436 Base Station to 47 CFR 15.247(c) Conducted Spurious Emissions 9kHz - 10GHz. EP-436 Base Station, Conducted Spurious Emissions Check. Fundamentals are measured. The lowest strength fundamental - 20dB is then programmed as the limit line.

Transducer Legend:

Measurement Data: Reading listed by margin. Test Distance: None

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	915.115M	135.2					+0.0	135.2	115.0 Mid Fundamental	+20.2	None
2	902.230M	135.1					+0.0	135.1	115.0 Low Fundamental	+20.1	None
3	927.820M	135.0					+0.0	135.0	115.0 High Fundamental	+20.0	None
4	1804.460M	91.1					+0.0	91.1	115.0 Low	-23.9	None
5	1830.400M	90.5					+0.0	90.5	115.0 Mid	-24.5	None
6	1855.830M	89.3					+0.0	89.3	115.0 High	-25.7	None
7	1025.850M	87.4					+0.0	87.4	115.0 Mid	-27.6	None
8	791.599M	85.6					+0.0	85.6	115.0 Low	-29.4	None
9	817.180M	85.2					+0.0	85.2	115.0 High	-29.8	None
10	1012.862M	83.1					+0.0	83.1	115.0 Low	-31.9	None
11	1038.580M	82.9					+0.0	82.9	115.0 High	-32.1	None

12	804.480M	81.1	+0.0	81.1	115.0 Mid	-33.9	None
13	2783.450M	79.0	+0.0	79.0	115.0 High	-36.0	None
14	2745.400M	76.8	+0.0	76.8	115.0 Mid	-38.2	None
15	4511.220M	73.3	+0.0	73.3	115.0 Low	-41.7	None

Test Location: CKC Laboratories •22105 Wilson River Hwy. • Tillamook,OR 97141 • 503 842-5577

Customer: **SuperTel Technologies, Inc.**
Specification: **FCC 15.207 COND**
Work Order #: **78176** Date: 2/14/02
Test Type: **Conducted Emissions** Time: 4:36:40 PM
Equipment: **900 MHz 4-Line WPABX** Sequence#: 6
Manufacturer: SuperTel Technologies Tested By: Mike Wilkinson
Model: EP-436 Base Set
S/N: ENG-1

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

Function	Manufacturer	Model #	S/N
900 MHz 4-Line WPABX	SuperTel Technologies	EP-436 Hand Set	ENG-1
900 MHz 4-Line WPABX*	SuperTel Technologies	EP-436 Base Set	ENG-1
900 MHz 4-Line WPABX	SuperTel Technologies	EP-436 Hand Set	ENG-1
Battery Charger	SuperTel Technologies	ENG-CH	None

Support Devices:

Function	Manufacturer	Model #	S/N
CD Player	Sony	D-131	5658402
Remote CO Simulator	Teltone	TLS-5	029081

Test Conditions / Notes:

The channels are locked and set to High Channel. EUT antenna is in the vertical position. 2 dBi gain antenna connected to the EUT. Base L-1 port is connected to the remote located CO Simulator via a 20 foot RJ-11 cable. L-2 through L-4 ports have unterminated 2 meter RJ 11 cables attached. Audio port is connected, via a 2 meter audio cable, to the CD Player which is playing a music CD. The EP-436 Handset is placed in the charger and is in the ring only mode. Frequency range investigated was 450 kHz to 30 MHz. Base set connected to measurement LISN.

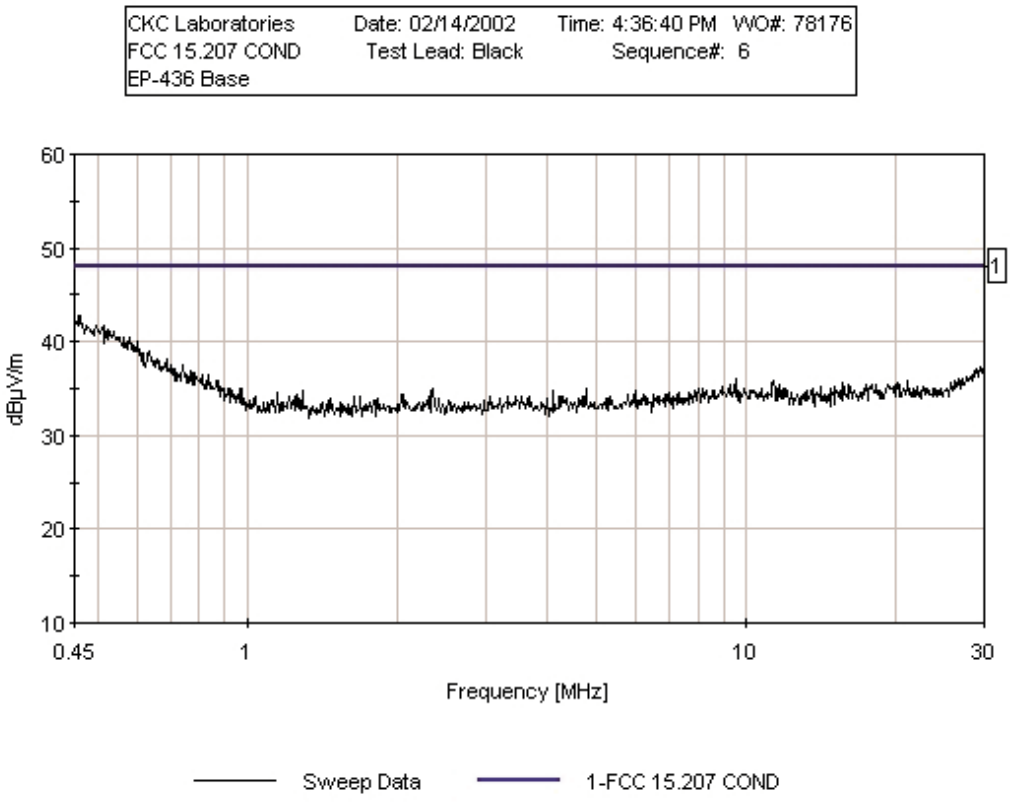
Transducer Legend:

T1=T1 conducted cables	T2=L11b

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	461.701k	42.5	+0.2	+0.1			+0.0	42.8	48.0	-5.2	Black
2	451.672k	42.3	+0.2	+0.1			+0.0	42.6	48.0	-5.4	Black
3	513.521k	41.5	+0.2	+0.1			+0.0	41.8	48.0	-6.2	Black
4	495.969k	41.5	+0.2	+0.1			+0.0	41.8	48.0	-6.2	Black
5	473.402k	41.5	+0.2	+0.1			+0.0	41.8	48.0	-6.2	Black
6	523.550k	41.0	+0.2	+0.1			+0.0	41.3	48.0	-6.7	Black
7	530.237k	40.7	+0.2	+0.1			+0.0	41.0	48.0	-7.0	Black
8	579.549k	40.2	+0.1	+0.1			+0.0	40.4	48.0	-7.6	Black
9	567.012k	40.1	+0.2	+0.1			+0.0	40.4	48.0	-7.6	Black

10	599.608k	39.8	+0.1	+0.1	+0.0	40.0	48.0	-8.0	Black
11	585.400k	39.6	+0.1	+0.1	+0.0	39.8	48.0	-8.2	Black
12	592.086k	39.4	+0.1	+0.1	+0.0	39.6	48.0	-8.4	Black
13	608.802k	38.9	+0.1	+0.1	+0.0	39.1	48.0	-8.9	Black
14	637.219k	38.8	+0.1	+0.1	+0.0	39.0	48.0	-9.0	Black
15	618.832k	38.6	+0.1	+0.1	+0.0	38.8	48.0	-9.2	Black



Test Location: CKC Laboratories •22105 Wilson River Hwy. • Tillamook,OR 97141 • 503 842-5577

Customer: **SuperTel Technologies, Inc.**
Specification: **FCC 15.207 COND**
Work Order #: **78176** Date: 2/14/02
Test Type: **Conducted Emissions** Time: 4:45:31 PM
Equipment: **900 MHz 4-Line WPABX** Sequence#: 7
Manufacturer: SuperTel Technologies Tested By: Mike Wilkinson
Model: EP-436 Base Set
S/N: ENG-1

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

Function	Manufacturer	Model #	S/N
900 MHz 4-Line WPABX	SuperTel Technologies	EP-436 Hand Set	ENG-1
900 MHz 4-Line WPABX*	SuperTel Technologies	EP-436 Base Set	ENG-1
900 MHz 4-Line WPABX	SuperTel Technologies	EP-436 Hand Set	ENG-1
Battery Charger	SuperTel Technologies	ENG-CH	None

Support Devices:

Function	Manufacturer	Model #	S/N
CD Player	Sony	D-131	5658402
Remote CO Simulator	Teltone	TLS-5	029081

Test Conditions / Notes:

The channels are locked and set to High Channel. EUT antenna is in the vertical position. 2 dBi gain antenna connected to the EUT. Base L-1 port is connected to the remote located CO Simulator via a 20 foot RJ-11 cable. L-2 through L-4 ports have unterminated 2 meter RJ 11 cables attached. Audio port is connected, via a 2 meter audio cable, to the CD Player which is playing a music CD. The EP-436 Handset is placed in the charger and is in the ring only mode. Frequency range investigated was 450 kHz to 30 MHz. Base set connected to measurement LISN.

Transducer Legend:

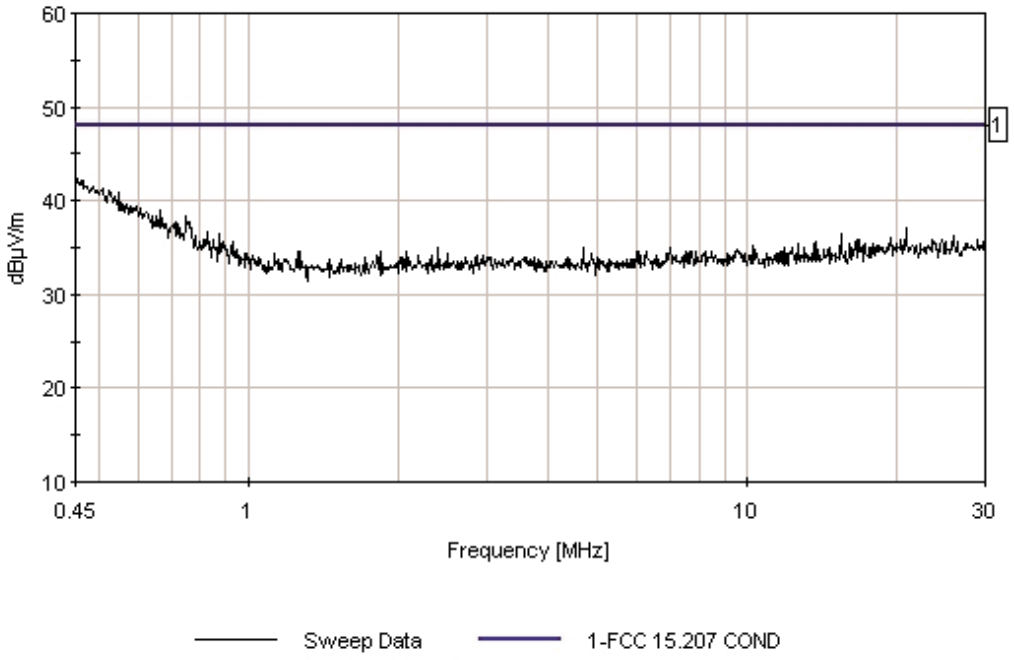
T1=T1 conducted cables	T2=L12w

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	451.672k	42.6	+0.2	+0.1			+0.0	42.9	48.0	-5.1	White
2	465.044k	41.9	+0.2	+0.1			+0.0	42.2	48.0	-5.8	White
3	487.611k	41.2	+0.2	+0.1			+0.0	41.5	48.0	-6.5	White
4	511.013k	41.0	+0.2	+0.1			+0.0	41.3	48.0	-6.7	White
5	524.386k	40.8	+0.2	+0.1			+0.0	41.1	48.0	-6.9	White
6	551.132k	40.6	+0.2	+0.1			+0.0	40.9	48.0	-7.1	White
7	538.595k	40.2	+0.2	+0.1			+0.0	40.5	48.0	-7.5	White
8	570.355k	39.4	+0.2	+0.1			+0.0	39.7	48.0	-8.3	White
9	561.997k	39.3	+0.2	+0.1			+0.0	39.6	48.0	-8.4	White

10	597.101k	39.3	+0.1	+0.1	+0.0	39.5	48.0	-8.5	White
11	580.385k	39.2	+0.1	+0.1	+0.0	39.4	48.0	-8.6	White
12	577.042k	39.1	+0.1	+0.1	+0.0	39.3	48.0	-8.7	White
13	608.802k	39.0	+0.1	+0.1	+0.0	39.2	48.0	-8.8	White
14	667.308k	38.9	+0.1	+0.0	+0.0	39.0	48.0	-9.0	White
15	623.846k	38.5	+0.1	+0.1	+0.0	38.7	48.0	-9.3	White

CKC Laboratories Date: 02/14/2002 Time: 4:45:31 PM WO#: 78176
FCC 15.207 COND Test Lead: White Sequence#: 7
EP-436 Base



Test Location: CKC Laboratories •22105 Wilson River Hwy. • Tillamook,OR 97141 • 503 842-5577

Customer: **SuperTel Technologies, Inc.**
Specification: **FCC15.247**
Work Order #: **78176** Date: 2/7/02
Test Type: **Radiated Scan** Time: 13:07:53
Equipment: **900 MHz 4-Line WPABX** Sequence#: 4
Manufacturer: SuperTel Technologies Tested By: Mike Wilkinson
Model: EP-436 Hand Set
S/N: ENG-1

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

Function	Manufacturer	Model #	S/N
900 MHz 4-Line WPABX*	SuperTel Technologies	EP-436 Hand Set	ENG-1

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

The channels are locked and are stepped through manually. The low channel = 902 MHz, mid channel = 915 MHz and high channel =928 MHz. Channel setting is as indicated for each reading in the datasheet. EUT tested in 3 orthogonal planes as indicated for each reading in the datasheet. 2 dBi gain antenna connected to the EUT. EUT is Battery operated. EIRP was calculated using the corrected reading in the datasheet less the distance correction factor and (EIRP) Peak power=(Ed)^2/30G. Calculated EIRP for the 6 highest readings are: 902 MHz, meter 109.3 dBuV + 26.1 dB = 135.4 dBuV = 0.729 Watt. 902 MHz, meter 109.2 dBuV + 26.1 dB = 135.3 dBuV = 0.713 Watt. 914 MHz, meter 109.0 dBuV + 26.1 dB = 135.1 dBuV = 0.681 Watt. 914 MHz. meter 108.7 dBuV + 26.1 dB = 134.8 dBuV = 0.635 Watt. 901 MHz meter 108.6 dBuV + 26.1 dB = 134.7 dBuV = 0.621 Watt. 928 MHz meter 108.2 dBuV + 26.1 dB = 134.4 dBuV = 0.579 Watt.

Transducer Legend:

T1=10' Silver Semflex SMA CKC P1403	T2=Horn 1-18

Measurement Data: Reading listed by margin. Test Distance: 1 Meter

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	902.000M	109.3	+1.2	+24.9			-10.0	125.4	137.0	-11.6	Horiz
									Low channel, side position		
2	902.000M	109.2	+1.2	+24.9			-10.0	125.3	137.0	-11.7	Horiz
									Low channel, horizontal position		
3	914.750M	109.0	+1.2	+24.9			-10.0	125.1	137.0	-11.9	Horiz
									Mid channel, side position		
4	914.950M	108.7	+1.2	+24.9			-10.0	124.8	137.0	-12.2	Horiz
									Mid channel, horizontal position		
5	901.950M	108.6	+1.2	+24.9			-10.0	124.7	137.0	-12.3	Vert
									Low channel. vertical position		
6	927.700M	108.2	+1.2	+25.0			-10.0	124.4	137.0	-12.6	Vert
									High channel, vertical position		

7	915.030M	108.3	+1.2	+24.9		-10.0	124.4	137.0	-12.6	Vert Mid channel, vertical position
8	927.800M	108.1	+1.2	+25.0		-10.0	124.3	137.0	-12.7	Horiz High channel, side position
9	927.880M	107.6	+1.2	+25.0		-10.0	123.8	137.0	-13.2	Horiz High channel, horizontal position
10	902.000M	103.1	+1.2	+24.9		-10.0	119.2	137.0	-17.8	Vert Low channel, horizontal position
11	902.100M	101.8	+1.2	+24.9		-10.0	117.9	137.0	-19.1	Vert Low channel, side position
12	914.880M	101.4	+1.2	+24.9		-10.0	117.5	137.0	-19.5	Vert Mid channel, horizontal position
13	914.880M	101.1	+1.2	+24.9		-10.0	117.2	137.0	-19.8	Vert Mid channel, side position
14	927.830M	99.8	+1.2	+25.0		-10.0	116.0	137.0	-21.0	Vert High channel, horizontal position
15	927.850M	99.0	+1.2	+25.0		-10.0	115.2	137.0	-21.8	Vert High channel, side position
16	902.200M	88.2	+1.2	+24.9		-10.0	104.3	137.0	-32.7	Horiz Low channel, vertical position
17	915.250M	87.3	+1.2	+24.9		-10.0	103.4	137.0	-33.6	Horiz Mid channel, vertical position
18	927.430M	86.2	+1.2	+25.0		-10.0	102.4	137.0	-34.6	Horiz High channel, vertical position

Test Location: CKC Laboratories •22105 Wilson River Hwy. • Tillamook,OR 97141 • 503 842-5577

Customer: **SuperTel Technologies, Inc.**
Specification: **FCC15.247 & 15.209**
Work Order #: **78176** Date: 2/14/02
Test Type: **Radiated Scan** Time: 15:26:03
Equipment: **900 MHz 4-Line WPABX** Sequence#: 6
Manufacturer: SuperTel Technologies Tested By: Mike Wilkinson
Model: EP-436 Hand Set
S/N: ENG-1

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

Function	Manufacturer	Model #	S/N
900 MHz 4-Line WPABX*	SuperTel Technologies	EP-436 Hand Set	ENG-1

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

The channels are locked and are stepped through manually. The low channel = 902 MHz, mid channel = 915 MHz and high channel = 928 MHz. Channel setting is as indicated for each reading in the datasheet. EUT tested in 3 orthogonal planes as indicated for each reading in the datasheet. 2 dBi gain antenna connected to the EUT. EUT is Battery operated. Test distance is 1 meter 0.9 GHz to 10.0 GHz. Test distance is 3 meters 15 MHz to 900 MHz. Frequency range investigated was 15 MHz to 10 GHz (lowest oscillator = 15.38 MHz, highest oscillator = 928 MHz).

Transducer Legend:

T1=26.5 GHz Amp	T2=6in SMA cable #2212
T3=Bilog A	T4=Amp-A
T5=10' Silver Semflex SMA CKC P1403	T6=Horn 1-18
T7=1.5 GHz HPF	

Measurement Data: Reading listed by margin. Test Distance: 1 Meter

#	Freq	Rdng	T1 T5	T2 T6	T3 T7	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	1038.450M Ave	34.6	+0.0 +1.2	+0.0 +25.5	+0.0 +0.0	+0.0	-10.0	51.3	54.0 High channel, side position	-2.7	Horiz
^	1038.450M	51.3	+0.0 +1.2	+0.0 +25.5	+0.0 +0.0	+0.0	-10.0	68.0	54.0 High channel, side position	+14.0	Horiz
3	963.523M QP	35.0	+0.0 +1.2	+0.0 +25.1	+0.0 +0.0	+0.0	-10.0	51.3	54.0 Mid channel, side position	-2.7	Vert
^	963.600M	51.7	+0.0 +1.2	+0.0 +25.1	+0.0 +0.0	+0.0	-10.0	68.0	54.0 Mid channel, side position	+14.0	Vert
5	4510.175M	65.2	-40.0 +2.6	+0.4 +32.8	+0.0 +0.3	+0.0	-10.0	51.3	54.0 Low channel, side position	-2.7	Horiz

6	1012.663M Ave	34.6	+0.0 +1.2	+0.0 +25.3	+0.0 +0.0	+0.0	-10.0	51.1	54.0	-2.9	Horiz
									Low channel, horizontal position		
^	1012.670M	54.1	+0.0 +1.2	+0.0 +25.3	+0.0	+0.0	-10.0	70.6	54.0	+16.6	Horiz
									Low channel, side position		
^	1012.663M	48.5	+0.0 +1.2	+0.0 +25.3	+0.0 +0.0	+0.0	-10.0	65.0	54.0	+11.0	Horiz
									Low channel, horizontal position		
9	1012.670M Ave	34.3	+0.0 +1.2	+0.0 +25.3	+0.0	+0.0	-10.0	50.8	54.0	-3.2	Horiz
									Low channel, side position		
10	4510.250M	64.4	-40.0 +2.6	+0.4 +32.8	+0.0 +0.3	+0.0	-10.0	50.5	54.0	-3.5	Vert
									Low channel, horizontal position		
11	791.411M QP	57.6	+0.0 +0.0	+0.0 +0.0	+21.8 +0.0	-27.9	-10.0	41.5	46.0	-4.5	Vert
									Low channel, vertical position		
^	791.385M	59.4	+0.0 +0.0	+0.0 +0.0	+21.8 +0.0	-27.9	-10.0	43.3	46.0	-2.7	Vert
									Low channel, vertical position		
13	589.828M	59.2	+0.0 +0.0	+0.0 +0.0	+19.4 +0.0	-27.9	-10.0	40.7	46.0	-5.3	Vert
									Low channel, vertical position		
14	589.815M	59.1	+0.0 +0.0	+0.0 +0.0	+19.4 +0.0	-27.9	-10.0	40.6	46.0	-5.4	Vert
									High channel, vertical position		
15	885.076M	54.9	+0.0 +0.0	+0.0 +0.0	+23.2 +0.0	-27.6	-10.0	40.5	46.0	-5.5	Vert
									High channel, vertical position		
16	4510.088M	62.3	-40.0 +2.6	+0.4 +32.8	+0.0 +0.3	+0.0	-10.0	48.4	54.0	-5.6	Horiz
									Low channel, horizontal position		
17	2744.750M Ave	66.4	-41.0 +2.0	+0.2 +30.2	+0.0 +0.3	+0.0	-10.0	48.1	54.0	-5.9	Vert
									Mid channel, vertical position		
18	2706.115M Ave	66.1	-41.0 +2.0	+0.2 +30.1	+0.0 +0.4	+0.0	-10.0	47.8	54.0	-6.2	Vert
									Low channel, side position		
^	2706.115M	91.8	-41.0 +2.0	+0.2 +30.1	+0.0 +0.4	+0.0	-10.0	73.5	54.0	+19.5	Vert
									Low channel,side position		
^	2706.100M	89.7	-41.0 +2.0	+0.2 +30.1	+0.0 +0.4	+0.0	-10.0	71.4	54.0	+17.4	Vert
									Low channel, horizontal position		
^	2706.100M	75.2	-41.0 +2.0	+0.2 +30.1	+0.0 +0.4	+0.0	-10.0	56.9	54.0	+2.9	Vert
									Low channel, horizontal position		

22	1038.450M Ave	30.7	+0.0 +1.2	+0.0 +25.5	+0.0 +0.0	+0.0	-10.0	47.4	54.0	-6.6	Vert High channel, vertical position
^	1038.450M	50.4	+0.0 +1.2	+0.0 +25.5	+0.0 +0.0	+0.0	-10.0	67.1	54.0	+13.1	Vert High channel, vertical position
24	2744.700M Ave	65.6	-41.0 +2.0	+0.2 +30.2	+0.0 +0.3	+0.0	-10.0	47.3	54.0	-6.7	Vert Mid channel, side position
25	9922.388M	51.3	-36.4 +3.9	+0.5 +36.4	+0.0 +1.5	+0.0	-10.0	47.2	54.0	-6.8	Vert Low channel, side position
26	7216.288M	57.2	-38.0 +3.3	+0.3 +34.3	+0.0 +0.1	+0.0	-10.0	47.2	54.0	-6.8	Vert Low channel, side position
27	817.184M QP	54.5	+0.0 +0.0	+0.0 +0.0	+22.1 +0.0	-27.8	-10.0	38.8	46.0	-7.2	Vert Mid channel, vertical position
^	817.184M	61.0	+0.0 +0.0	+0.0 +0.0	+22.1 +0.0	-27.8	-10.0	45.3	46.0	-0.7	Vert Mid channel, vertical position
29	9020.438M	53.2	-37.0 +3.7	+0.3 +35.6	+0.0 +0.9	+0.0	-10.0	46.7	54.0	-7.3	Horiz Low channel, side position
30	9922.438M	50.3	-36.4 +3.9	+0.5 +36.4	+0.0 +1.5	+0.0	-10.0	46.2	54.0	-7.8	Horiz Low channel, side position
31	2783.450M Ave	63.9	-41.0 +2.0	+0.2 +30.4	+0.0 +0.3	+0.0	-10.0	45.8	54.0	-8.2	Vert High channel, side position
^	2783.450M	87.3	-41.0 +2.0	+0.2 +30.4	+0.0 +0.3	+0.0	-10.0	69.2	54.0	+15.2	Vert High channel, side position
33	580.335M	55.9	+0.0 +0.0	+0.0 +0.0	+19.4 +0.0	-27.9	-10.0	37.4	46.0	-8.6	Vert High channel, vertical position
34	8118.613M	53.1	-37.4 +3.5	+0.2 +35.4	+0.0 +0.4	+0.0	-10.0	45.2	54.0	-8.8	Horiz Low channel, side position
35	2744.738M Ave	63.4	-41.0 +2.0	+0.2 +30.2	+0.0 +0.3	+0.0	-10.0	45.1	54.0	-8.9	Vert Mid channel, horizontal position
^	2744.700M	92.2	-41.0 +2.0	+0.2 +30.2	+0.0 +0.3	+0.0	-10.0	73.9	54.0	+19.9	Vert Mid channel, side position
^	2744.750M	91.3	-41.0 +2.0	+0.2 +30.2	+0.0 +0.3	+0.0	-10.0	73.0	54.0	+19.0	Vert Mid channel, vertical position
^	2744.738M	87.7	-41.0 +2.0	+0.2 +30.2	+0.0 +0.3	+0.0	-10.0	69.4	54.0	+15.4	Vert Mid channel, horizontal position

39	2706.100M Ave	62.8	-41.0 +2.0	+0.2 +30.1	+0.0 +0.4	+0.0	-10.0	44.5	54.0	-9.5	Vert Low channel, horizontal position
40	2783.450M Ave	62.4	-41.0 +2.0	+0.2 +30.4	+0.0 +0.3	+0.0	-10.0	44.3	54.0	-9.7	Horiz High channel, side position
^	2783.450M	86.2	-41.0 +2.0	+0.2 +30.4	+0.0 +0.3	+0.0	-10.0	68.1	54.0	+14.1	Horiz High channel, side position
42	8118.288M	51.9	-37.4 +3.5	+0.2 +35.4	+0.0 +0.4	+0.0	-10.0	44.0	54.0	-10.0	Vert Low channel, side position
43	1012.663M Ave	27.2	+0.0 +1.2	+0.0 +25.3	+0.0 +0.0	+0.0	-10.0	43.7	54.0	-10.3	Vert Low channel, horizontal position
^	1012.663M	39.4	+0.0 +1.2	+0.0 +25.3	+0.0 +0.0	+0.0	-10.0	55.9	54.0	+1.9	Vert Low channel, horizontal position
45	2706.000M Ave	60.8	-41.0 +2.0	+0.2 +30.1	+0.0 +0.4	+0.0	-10.0	42.5	54.0	-11.5	Horiz Low channel, side position
^	2706.088M	87.1	-41.0 +2.0	+0.2 +30.1	+0.0 +0.4	+0.0	-10.0	68.8	54.0	+14.8	Horiz Low channel, side position
^	2706.038M	62.8	-41.0 +2.0	+0.2 +30.1	+0.0 +0.4	+0.0	-10.0	44.5	54.0	-9.5	Horiz Low channel, horizontal position
48	9020.288M	48.0	-37.0 +3.7	+0.3 +35.6	+0.0 +0.9	+0.0	-10.0	41.5	54.0	-12.5	Vert Low channel, side position
49	7216.300M	51.5	-38.0 +3.3	+0.3 +34.3	+0.0 +0.1	+0.0	-10.0	41.5	54.0	-12.5	Horiz Low channel, side position
50	2706.100M Ave	58.4	-41.0 +2.0	+0.2 +30.1	+0.0 +0.4	+0.0	-10.0	40.1	54.0	-13.9	Vert Low channel, horizontal position
51	2744.738M Ave	56.6	-41.0 +2.0	+0.2 +30.2	+0.0 +0.3	+0.0	-10.0	38.3	54.0	-15.7	Horiz Mid channel, horizontal position
^	2744.738M	70.8	-41.0 +2.0	+0.2 +30.2	+0.0 +0.3	+0.0	-10.0	52.5	54.0	-1.5	Horiz Mid channel, horizontal position
53	3659.675M Ave	52.0	-39.0 +2.3	+0.3 +32.0	+0.0 +0.4	+0.0	-10.0	38.0	54.0	-16.0	Vert Mid channel, vertical position
^	3659.680M	75.6	-39.0 +2.3	+0.3 +32.0	+0.0 +0.4	+0.0	-10.0	61.6	54.0	+7.6	Vert Mid channel, vertical position
^	3659.688M	73.1	-39.0 +2.3	+0.3 +32.0	+0.0 +0.4	+0.0	-10.0	59.1	54.0	+5.1	Vert Mid channel, side position

56	4574.712M Ave	51.3	-40.0 +2.7	+0.3 +32.9	+0.0 +0.3	+0.0	-10.0	37.5	54.0	-16.5	Vert Mid channel, vertical position
^	4574.738M	71.2	-40.0 +2.7	+0.3 +32.9	+0.0 +0.3	+0.0	-10.0	57.4	54.0	+3.4	Vert Mid channel, vertical position
58	3711.262M Ave	50.6	-39.0 +2.4	+0.3 +32.0	+0.0 +0.4	+0.0	-10.0	36.7	54.0	-17.3	Vert High channel, side position
^	3711.263M	75.9	-39.0 +2.4	+0.3 +32.0	+0.0 +0.4	+0.0	-10.0	62.0	54.0	+8.0	Vert High channel, side position
60	595.918M QP	46.6	+0.0 +0.0	+0.0 +0.0	+19.4 +0.0	-27.9	-10.0	28.1	46.0	-17.9	Vert Mid channel, vertical position
^	595.898M	60.2	+0.0 +0.0	+0.0 +0.0	+19.4 +0.0	-27.9	-10.0	41.7	46.0	-4.3	Vert Mid channel, vertical position
62	1057.651M Ave	18.8	+0.0 +1.2	+0.0 +25.7	+0.0	+0.0	-10.0	35.7	54.0	-18.3	Horiz Low channel, side position
^	1057.651M	50.4	+0.0 +1.2	+0.0 +25.7	+0.0	+0.0	-10.0	67.3	54.0	+13.3	Horiz Low channel, side position
64	3608.137M Ave	49.6	-39.0 +2.3	+0.3 +32.0	+0.0 +0.4	+0.0	-10.0	35.6	54.0	-18.4	Vert Low channel, side position
65	1804.000M Ave	54.4	-42.0 +1.6	+0.2 +29.0	+0.0 +0.7	+0.0	-10.0	33.9	54.0	-20.1	Horiz Low channel, side position
^	1804.030M	79.3	-42.0 +1.6	+0.2 +29.0	+0.0 +0.7	+0.0	-10.0	58.8	54.0	+4.8	Horiz Low channel, side position
67	3659.688M Ave	47.7	-39.0 +2.3	+0.3 +32.0	+0.0 +0.4	+0.0	-10.0	33.7	54.0	-20.3	Vert Mid channel, side position
68	3608.212M Ave	47.6	-39.0 +2.3	+0.3 +32.0	+0.0 +0.4	+0.0	-10.0	33.6	54.0	-20.4	Vert Low channel, horizontal position
^	3608.213M	75.7	-39.0 +2.3	+0.3 +32.0	+0.0 +0.4	+0.0	-10.0	61.7	54.0	+7.7	Vert Low channel, horizontal position
^	3608.138M	74.9	-39.0 +2.3	+0.3 +32.0	+0.0 +0.4	+0.0	-10.0	60.9	54.0	+6.9	Vert Low channel, side position
71	1804.137M Ave	53.3	-42.0 +1.6	+0.2 +29.0	+0.0 +0.7	+0.0	-10.0	32.8	54.0	-21.2	Vert Low channel, side position
^	1804.138M	78.4	-42.0 +1.6	+0.2 +29.0	+0.0 +0.7	+0.0	-10.0	57.9	54.0	+3.9	Vert Low channel, side position

73	3608.163M Ave	44.2	-39.0 +2.3	+0.3 +32.0	+0.0 +0.4	+0.0	-10.0	30.2	54.0	-23.8	Horiz
									Low channel, horizontal position		
^	3608.163M	68.8	-39.0 +2.3	+0.3 +32.0	+0.0 +0.4	+0.0	-10.0	54.8	54.0	+0.8	Horiz
									Low channel, horizontal position		
^	3608.175M	63.0	-39.0 +2.3	+0.3 +32.0	+0.0 +0.4	+0.0	-10.0	49.0	54.0	-5.0	Horiz
									Low channel, side position		
76	6314.313M Ave	40.5	-39.0 +3.1	+0.4 +34.4	+0.0 +0.1	+0.0	-10.0	29.5	54.0	-24.5	Vert
									Low channel, side position		
^	6314.313M	64.2	-39.0 +3.1	+0.4 +34.4	+0.0 +0.1	+0.0	-10.0	53.2	54.0	-0.8	Vert
									Low channel, side position		
78	5412.175M Ave	41.0	-39.0 +2.8	+0.4 +33.7	+0.0 +0.2	+0.0	-10.0	29.1	54.0	-24.9	Horiz
									Low channel, side position		
^	5412.175M	61.7	-39.0 +2.8	+0.4 +33.7	+0.0 +0.2	+0.0	-10.0	49.8	54.0	-4.2	Horiz
									Low channel, side position		
80	4509.320M Ave	41.7	-40.0 +2.6	+0.4 +32.8	+0.0 +0.3	+0.0	-10.0	27.8	54.0	-26.2	Horiz
									Low channel, side position		
81	4510.137M Ave	41.5	-40.0 +2.6	+0.4 +32.8	+0.0 +0.3	+0.0	-10.0	27.6	54.0	-26.4	Vert
									Low channel, side position		
^	4510.213M	65.7	-40.0 +2.6	+0.4 +32.8	+0.0 +0.3	+0.0	-10.0	51.8	54.0	-2.2	Vert
									Low channel, side position		
83	5412.175M Ave	37.5	-39.0 +2.8	+0.4 +33.7	+0.0 +0.2	+0.0	-10.0	25.6	54.0	-28.4	Vert
									Low channel, side position		
^	5412.175M	63.1	-39.0 +2.8	+0.4 +33.7	+0.0 +0.2	+0.0	-10.0	51.2	54.0	-2.8	Vert
									Low channel, side position		

Test Location: CKC Laboratories •5473A Clouds Rest. • Mariposa, CA 95338 • 209-966-4257

Customer: **SuperTel**
Specification: **FCC15.247(c) EP-436 Handset**
Work Order #: **78247** Date: 2/25/02
Test Type: **Antenna Conducted Spurious Emissions** Time: 15:33:12
Equipment: **4 Line WPABX Handset** Sequence#: 1
Manufacturer: SuperTel Tested By: Randal Clark
Model: EP-436
S/N: none

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

Function	Manufacturer	Model #	S/N
4 Line WPABX Handset*	SuperTel	EP-436	none

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Testing to show compliance of the EP-436 Handset to 47 CFR 15.247(c) Conducted Spurious Emissions 9kHz - 10GHz. EP-436 Handset, Conducted Spurious Emissions Check. Fundamentals are measured. The lowest strength fundamental - 20dB is then programmed as the limit line.

Transducer Legend:

Measurement Data: Reading listed by margin. Test Distance: None

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	927.800M	134.4					+0.0	134.4	113.7 High Fundamental	+20.7	None
2	914.920M	134.4					+0.0	134.4	113.7 Mid Fundamental	+20.7	None
3	902.055M	133.7					+0.0	133.7	113.7 Low Fundamental	+20.0	None
4	1804.150M	91.4					+0.0	91.4	113.7 Low	-22.3	None
5	1829.920M	89.5					+0.0	89.5	113.7 Mid	-24.2	None
6	1855.730M	88.6					+0.0	88.6	113.7 High	-25.1	None
7	791.400M	75.7					+0.0	75.7	113.7 Low	-38.0	None
8	589.920M	74.7					+0.0	74.7	113.7 Mid	-39.0	None
9	589.900M	73.9					+0.0	73.9	113.7 Low	-39.8	None
10	589.830M	72.9					+0.0	72.9	113.7 High	-40.8	None
11	1012.700M	72.0					+0.0	72.0	113.7 Low	-41.7	None

Test Location: CKC Laboratories •22105 Wilson River Hwy. • Tillamook,OR 97141 • 503 842-5577

Customer: **SuperTel Technologies, Inc.**
Specification: **FCC 15.207 COND**
Work Order #: **78176** Date: 2/14/02
Test Type: **Conducted Emissions** Time: 4:56:44 PM
Equipment: **900 MHz 4-Line WPABX** Sequence#: 9
Manufacturer: SuperTel Technologies Tested By: Mike Wilkinson
Model: EP-436 Hand Set
S/N: ENG-1

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

Function	Manufacturer	Model #	S/N
900 MHz 4-Line WPABX	SuperTel Technologies	EP-436 Hand Set	ENG-1
900 MHz 4-Line WPABX	SuperTel Technologies	EP-436 Base Set	ENG-1
900 MHz 4-Line WPABX*	SuperTel Technologies	EP-436 Hand Set	ENG-1
Battery Charger	SuperTel Technologies	ENG-CH	None

Support Devices:

Function	Manufacturer	Model #	S/N
CD Player	Sony	D-131	5658402
Remote CO Simulator	Teltone	TLS-5	029081

Test Conditions / Notes:

The channels are locked and set to High Channel. EUT antenna is in the vertical position. 2 dBi gain antenna connected to the EUT. Base L-1 port is connected to the remote located CO Simulator via a 20 foot RJ-11 cable. L-2 through L-4 ports have unterminated 2 meter RJ 11 cables attached. Audio port is connected, via a 2 meter audio cable, to the CD Player which is playing a music CD. The EP-436 Handset is placed in the charger and is in the ring only mode. Frequency range investigated was 450 kHz to 30 MHz. Charger w/ Handset set connected to measurement LISN.

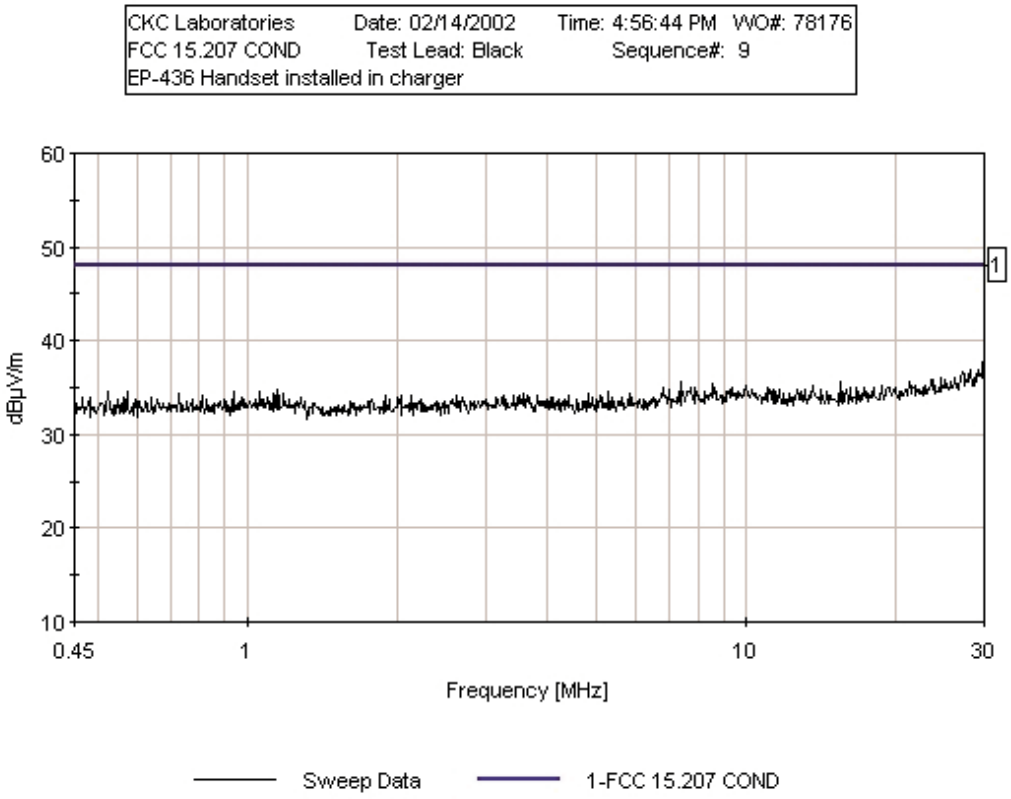
Transducer Legend:

T1=T1 conducted cables	T2=L14b

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	29.844M	34.3	+1.5	+2.0			+0.0	37.8	48.0	-10.2	Black
2	29.298M	33.5	+1.5	+1.9			+0.0	36.9	48.0	-11.1	Black
3	28.050M	33.7	+1.5	+1.6			+0.0	36.8	48.0	-11.2	Black
4	27.056M	33.7	+1.5	+1.4			+0.0	36.6	48.0	-11.4	Black
5	27.504M	33.5	+1.5	+1.5			+0.0	36.5	48.0	-11.5	Black
6	28.869M	33.1	+1.5	+1.8			+0.0	36.4	48.0	-11.6	Black
7	24.540M	33.8	+1.4	+0.9			+0.0	36.1	48.0	-11.9	Black
8	26.295M	33.3	+1.5	+1.2			+0.0	36.0	48.0	-12.0	Black

9	25.125M	33.4	+1.5	+0.9		+0.0	35.8	48.0	-12.2	Black
10	23.546M	33.6	+1.4	+0.8		+0.0	35.8	48.0	-12.2	Black
11	25.710M	33.1	+1.5	+1.1		+0.0	35.7	48.0	-12.3	Black
12	21.303M	33.7	+1.4	+0.6		+0.0	35.7	48.0	-12.3	Black
13	15.414M	34.2	+1.2	+0.3		+0.0	35.7	48.0	-12.3	Black
14	7.400M	34.4	+0.8	+0.4		+0.0	35.6	48.0	-12.4	Black
15	8.561M	34.1	+0.9	+0.5		+0.0	35.5	48.0	-12.5	Black



Test Location: CKC Laboratories •22105 Wilson River Hwy. • Tillamook,OR 97141 • 503 842-5577

Customer: **SuperTel Technologies, Inc.**
Specification: **FCC 15.207 COND**
Work Order #: **78176** Date: 2/14/02
Test Type: **Conducted Emissions** Time: 4:53:03 PM
Equipment: **900 MHz 4-Line WPABX** Sequence#: 8
Manufacturer: SuperTel Technologies Tested By: Mike Wilkinson
Model: EP-436 Hand Set
S/N: ENG-1

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

Function	Manufacturer	Model #	S/N
900 MHz 4-Line WPABX	SuperTel Technologies	EP-436 Hand Set	ENG-1
900 MHz 4-Line WPABX	SuperTel Technologies	EP-436 Base Set	ENG-1
900 MHz 4-Line WPABX*	SuperTel Technologies	EP-436 Hand Set	ENG-1
Battery Charger	SuperTel Technologies	ENG-CH	None

Support Devices:

Function	Manufacturer	Model #	S/N
CD Player	Sony	D-131	5658402
Remote CO Simulator	Teltone	TLS-5	029081

Test Conditions / Notes:

The channels are locked and set to High Channel. EUT antenna is in the vertical position. 2 dBi gain antenna connected to the EUT. Base L-1 port is connected to the remote located CO Simulator via a 20 foot RJ-11 cable. L-2 through L-4 ports have unterminated 2 meter RJ 11 cables attached. Audio port is connected, via a 2 meter audio cable, to the CD Player which is playing a music CD. The EP-436 Handset is placed in the charger and is in the ring only mode. Frequency range investigated was 450 kHz to 30 MHz. Charger w/ Handset set connected to measurement LISN.

Transducer Legend:

T1=T1 conducted cables	T2=L13w

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	29.435M	33.8	+1.5	+1.1			+0.0	36.4	48.0	-11.6	White
2	24.969M	34.1	+1.4	+0.9			+0.0	36.4	48.0	-11.6	White
3	29.766M	33.4	+1.5	+1.1			+0.0	36.0	48.0	-12.0	White
4	27.075M	33.5	+1.5	+1.0			+0.0	36.0	48.0	-12.0	White
5	30.000M	33.2	+1.5	+1.1			+0.0	35.8	48.0	-12.2	White
6	27.348M	33.3	+1.5	+1.0			+0.0	35.8	48.0	-12.2	White
7	26.100M	33.4	+1.5	+0.9			+0.0	35.8	48.0	-12.2	White
8	21.303M	33.8	+1.4	+0.6			+0.0	35.8	48.0	-12.2	White

9	28.694M	33.1	+1.5	+1.1	+0.0	35.7	48.0	-12.3	White
10	26.646M	33.0	+1.5	+1.0	+0.0	35.5	48.0	-12.5	White
11	22.434M	33.4	+1.4	+0.7	+0.0	35.5	48.0	-12.5	White
12	19.470M	33.7	+1.3	+0.5	+0.0	35.5	48.0	-12.5	White
13	25.515M	33.0	+1.5	+0.9	+0.0	35.4	48.0	-12.6	White
14	23.643M	33.2	+1.4	+0.8	+0.0	35.4	48.0	-12.6	White
15	20.406M	33.6	+1.3	+0.5	+0.0	35.4	48.0	-12.6	White