NEMKO Test Report No.:	1L0242RUS1
Applicant:	Communication Components Inc. 299 Forest Ave. Paramus, NJ 07652
Equipment Under Test:	CE-1819-100 CDMA Cell Extender
FCC ID:	NT3CE-1819
In Accordance With:	FCC Part 24, Subpart E Broadband PCS Repeaters
Tested By:	Nemko Dallas Inc. 802 N. Kealy Lewisville, Texas 75057-3136
Authorized By:	Jom Jiekwell Tom Tidwell, RF Group Manager
Date:	7/2/01

44

Total Number of Pages:

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EQUIPMENT:	CE-1819-100 CDMA Cell Extender	
FCC ID:		PROJ

Section 1. **Summary of Test Results**

- **Communication Components** Manufacturer:
- CE-1819-100 CDMA Cell Extender Model No.:

None Serial No.:

General: All measurements are traceable to national standards.

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 24, Subpart E.

\square	New Submission	\square	Production Unit
	Class II Permissive Change		Pre-Production Unit

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE. See " Summary of Test Data".



NVLAP LAB CODE: 100426-0

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Summary Of Test Data

	PARA.			
NAME OF TEST	NO.	SPEC.	MEAS.	RESULT
RF Power Output	24.232	100W	<100W	Complies
Occupied Bandwidth (CDMA)	24.238	Input/Output	Plot	Complies
Occupied Bandwidth (GSM)	24.238	Input/Output	N/A	N/A
Occupied Bandwidth (NADC)	24.238	Input/Output	Plot	Complies
Spurious Emissions at Antenna	24.238(a)	-13 dBm	< -13 dBm	Complies
Terminals	24.230(a)	-15 ubiii	< -13 ubiii	Compiles
Field Strength of Spurious	24.238(a)	-13 dBm	< -13 dBm	Complies
Emissions	24.230(a)	E.I.R.P.	< -13 ubiii	Compiles
Frequency Stability	24.235		N/A	N/A

Footnotes:

(1) Modulation characteristics were not tested since the E.U.T. processes but does not produce a modulated waveform.

Measurement uncertainty for each test configuration is expressed to 95% probability.

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Section 2. General Equipment Specification

Supply Voltage Input:	115 VAC
Frequency Bands: Downlink:	Block A : 1930 – 1945 MHz Block D : 1945 – 1950 MHz
	Block B : $1950 - 1965$ MHz
	Block E: 1965 – 1970 MHz
	Block F : 1970 – 1975 MHz
	Block C : 1975 – 1990 MHz
Frequency Bands: Uplink:	Block A: 1850 – 1865 MHz
	Block B : 1865 – 1870 MHz
	Block C : $1870 - 1885$ MHz
	Block D : 1885 – 1890 MHz
	Block E: 1890 - 1895 MHz
	Block F: 1895 – 1910 MHz
Type of Modulation and Designator:	CDMA GSM NADC (G7W) (GXW) (DXW)
Output Impedance:	50 ohms
RF Output (Rated): Uplink	Per channel: N/A W Total: N/A W
RF Output (Rated): Downlink	Per channel: 21.9 W 2 W Total: 43.7 W 4 W
Frequency Translation:	F1-F1 F1-F2 N/A Image: Constraint of the second s
Band Selection:	Software Duplexer Fullband

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Description of Modifications For Class II Permissive Change



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Modifications Made During Testing

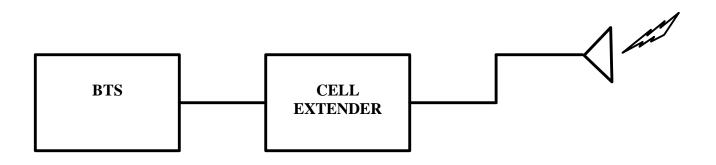


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Description of Operation

Communication Components Inc., Cell Extender products are designed to extend the range and coverage area of CDMA / TDMA type base stations in PCS wireless communications.

System Diagram



Section 3. **RF Power Output**

NAME OF TEST: RF Power Output

TESTED BY: Chinda PoyTTidwell

PARA. NO.: 2.1046

DATE: 5/14/01

Complies. **Test Results:**

Measurement Data:

	Modulation Type	Per Channel Output Power (dBm)	Composite Output Power (dBm)
Uplink	CDMA	N/A	N/A
Downlink	CDMA	43.4	46.4
Uplink	NADC	N/A	N/A
Downlink	NADC	33.3	36.3

Equipment Used: 1464-1065-1064-1045

Measurement Uncertainty: +/- 1.7 dB

Temperature: 22 °C

Relative 50 % **Humidity:**

EQUIPMENT:	CE-1819-100 CDMA Cell Extender
FCC ID:	

Section 4. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth (CDMA)	PARA. NO.: 2.1049
TESTED BY: Chinda PoyTTidwell	DATE: 5/14/01

Test Results: Complies.

Test Data: See attached plot(s).

Equipment Used: 1464-1065-1064-1045

Measurement Uncertainty: +/- 1.7 dB

Temperature: 22 °C

Relative 50 % Humidity:

FCC ID:

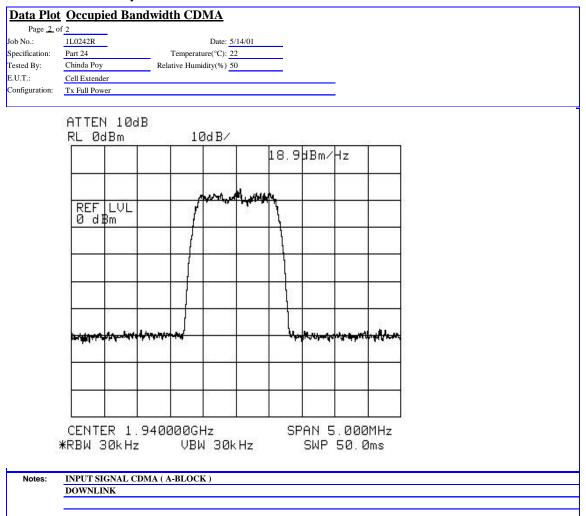
PROJECT NO.: 1L0242RUS1

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nge <u>1</u> o												C	Compl
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tion:	Part 24			-	ture(°C): 2								
y:	Chinda Poy		Relati	ve Hun	nidity(%)	50							
	Cell Extende												
ation: Jumber	Tx Full Pow	er											
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	-	-				Cable #	-	1045					
		_				Cable #	¥2:						
:	1464	_				Cable #	¥3:						
or #1	1604	_				Cable #	¥4:						
or #2:	1065					Mix	er:						
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Test Data—Occupied Bandwidth—CDMA



PROJECT NO.: 1L0242RUS1

Test Data—Occupied Bandwidth—CDMA

Data Plot	Occupie	d Band	width Cl	DMA									
Page 1 of	f <u>2</u>									Complete Preliminary	Х	_	
ob No.:	1L0242R			Date: 5	/21/01					Preliminary			
pecification:	Part 24		Temper	ature(°C): 2								_	
ested By:	Chinda Poy		Relative Hu										
.U.T.:	Cell Extender			(,,,) <u>-</u>	0								
onfiguration:	Tx Full Powe							-					
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ample Number:													
ocation:	Lab 2						er to plots	-					
etector Type:	Peak				VB	W: Refe	er to plots	•					
est Equipm	ent Used												
ntenna:				Direc	tional Coupl								
re-Amp:					Cable #	¥1:	1045						
ilter:					Cable #								
eceiver:	1464				Cable #	¥3:		-					
ttenuator #1	1604				Cable #	-		-					
Attenuator #2:	1065					er:		•					
dditional equip					1011A			-					
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	RBW 3			W 30H	Hz		SWP						
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Notes:	OUTPUTS	IGNAL CT	MA (C-BL	OCK)									
Notes.	DOWNLIN		THA (C-DL	UCK)									
	DOWNLIN	N											

FCC ID:

PROJECT NO.: 1L0242RUS1

Test Data—Occupied Bandwidth—CDMA

Data Plot	Occupied Bandwidth CDMA		
Page <u>2</u> c			
ob No.:	1L0242R Date: 5/21/01		
pecification:	Part 24 Temperature(°C): 22		
ested By:	Chinda Poy Relative Humidity(%) 50		
E.U.T.: Configuration:	Cell Extender Tx Full Power		
onfiguration:	1x Full Power		
	ATTEN 18-IP		
	ATTEN 10dB RL 0dBm 10dB∕		
	REF LVL	MA	
	at the property and permant	When a hope and a second and and	
	CENTER 1.982500GHz	SPAN 5.000MHz	
	RBW 30kHz VBW 30kHz	SWP 50.0ms	
	NDW SORTZ VDW SORTZ	JAI JU. UIIS	
Notes:	INPUT SIGNAL CDMA (C-BLOCK)		
	DOWNLINK		

FCC PART 24, SUBPART E BROADBAND PCS REPEATERS

EQUIPMENT: CE-1819-100 CDMA Cell Extender *FCC ID:*

PROJECT NO.: 1L0242RUS1

NAME OF TEST: Occupi	NAME OF TEST: Occupied Bandwidth (NADC)PARA. NO.: 2.1049										
TESTED BY: Chinda Poy	TTidwell	DATE: 5/14/01									
Test Results:	Complies.										
Test Data:	See attached plot(s).										
Equipment Used: 1464	-1064-1065-1045										
Measurement Uncertaint	y: +/- 1.7 dB										
Temperature: 22	°C										
Relative 50 Humidity:	%										

FCC ID:

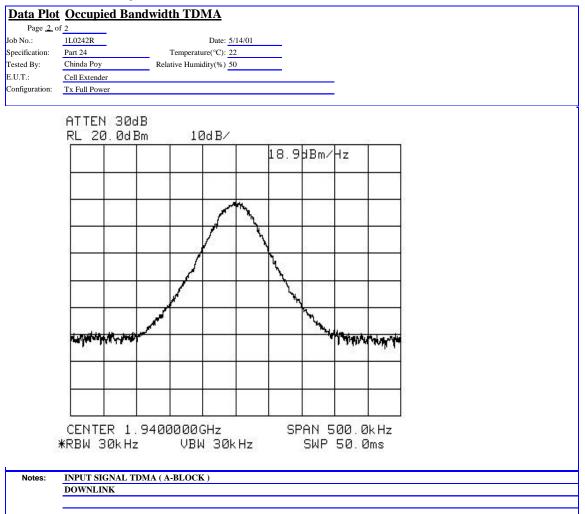
PROJECT NO.: 1L0242RUS1

<u>ata Plot</u>	Occupied B	<u>andwidth</u>	TDMA						
Page 1 of	f <u>2</u>								Complete X
b No.:	1L0242R		Date: 5	/14/01					Preliminary
ecification:	Part 24	Ter	nperature(°C): 2	2					
sted By:	Chinda Poy	Relative	e Humidity(%) 5	0					
.T.:	Cell Extender								
figuration:	Tx Full Power								
ple Number:			_						
ation:	Lab 2				W: Refer				
ctor Type:	Peak			VB	W: Refer	to plots			
t Equipm	ent Used								
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Amp:					#1:	1045	•		
er:				Cable	#2:				
eiver:	1464			Cable	#3:				
enuator #1	1064			Cable	#4:				
enuator #2:	1065			Miz	ker:				
ditional equip									
asurement Un	certainty: +/-3.	6 dB							
ł	CENTER 1.94000	300GHz			A A A A A A A A A A A A A A A A A A A			*	
Notes:	CENTER 1 *RBW 30kF OUTPUT SIGNA DOWNLINK	łz	VBW 304	Hz		AN 5 SWP			

FCC ID:

PROJECT NO.: 1L0242RUS1

Test Data—Occupied Bandwidth—TDMA



PROJECT NO.: 1L0242RUS1

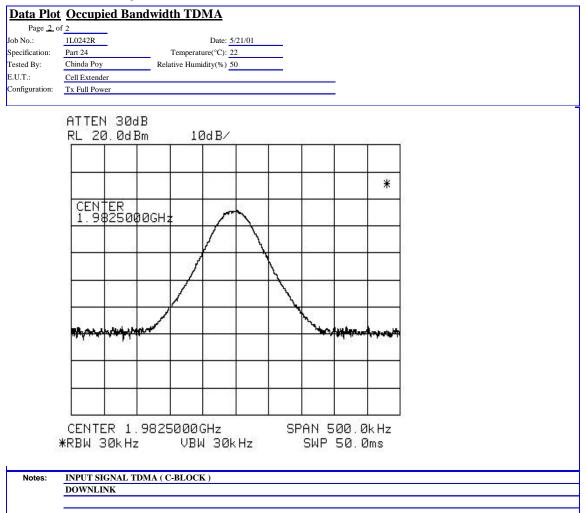
Test Data—Occupied Bandwidth—TDMA

Data Plot	Occupied Bandwidth TDMA	
Page <u>1</u> o		Complete X
Job No.:	1L0242R Date: 5/21/01	Complete X Preliminary
Specification:	Part 24 Temperature(°C): 22	
Tested By:	Chinda Poy Relative Humidity(%) 50	
E.U.T.:	Cell Extender	
Configuration:	Tx Full Power	
Sample Number:		
Location:	Lab 2 RBW: Refer to plots	
Detector Type:	Peak VBW: Refer to plots	
Test Equipm	ent Used	
Antenna:	Directional Coupler:	
Pre-Amp:	Cable #1: 1045	
Filter:	Cable #2:	
Receiver:	1464 Cable #3:	
Attenuator #1	1064 Cable #4:	
Attenuator #2:	1065 Mixer:	
Additional equip		
Measurement Un		
Ţ	ATTEN 40dB RL 61.3dBm 10dB/	
Notes:	CENTER 1.9825000GHz SPAN 500.0kHz KRBW 30kHz VBW 30kHz SWP 50.0ms OUTPUT SIGNAL TDMA (C-BLOCK) DOWNLINK	

FCC ID:

PROJECT NO.: 1L0242RUS1

Test Data—Occupied Bandwidth—TDMA



EQUIPMENT:	CE-1819-100 CDMA Cell Extender
FCC ID:	

Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 2.1051
TESTED BY: Chinda PoyTTidwell	DATE: 5/14/01

Test Results:	Complies.
Test Data:	See attached plot(s)
Equipment Used:	1464-1064-1065-1045
Measurement Unco	ertainty: +/- 1.7 dB
Temperature:	22 °C
Relative Humidity:	50 %

FCC ID:

PROJECT NO.: 1L0242RUS1

Data Plot	SPUR	IOUS I	EMISS	IONS	AT A	NTEN	INA 1	FERM	INAL	S				
Page <u>1</u> of											Complete	X		
Job No.:	1L0242R				Date: 5/	/14/01					Preliminary	,	_	
Specification:	Part 24			Femperatu	are(°C): 22	2							_	
Tested By:	Chinda Poy	,	Rela	tive Humi	dity(%) 50	0								
E.U.T.:	Cell Extend	ler												
Configuration:	Tx Full Pov	ver												
Sample Number:														
Location:	Lab 2	_				RB	W: Refe	er to plots						
Detector Type:	Peak	-				VB	W: Refe	er to plots						
Test Equipme	ent Used													
Antenna:		_			Direct	ional Coup	ler:							
Pre-Amp:		_				Cable	#1:	1045						
Filter:		_				Cable	#2:							
Receiver:	1464	_				Cable	#3:							
Attenuator #1	1064	_				Cable	#4:							
Attenuator #2:	1065					Miz	xer:							
Additional equip														
Measurement Un	certainty:	+/-3.6	dB											
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cification:		Temperature(°C): 22				
ted By: .T.:	Cell Extender	tive Humidity(%) 50				
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nguration.	1x Full Power			-		
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	- 8.67 dBm					
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Notes:	1 GHz - 20 GHz					
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PROJECT NO.: 1L0242RUS1

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N 15.00MHz VP 50.0ms

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Page 1 of											Comple	te X	
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Specification:	part 22		Te	mperatu	re(°C): 22	2						·	
Fested By:	Chinda Poy				lity(%) 50								
E.U.T.:	Cell Extender					•	_						
Configuration:	Tx Full Power								-				
ample Number:									-				
ocation:	Lab 2			_		DD	W. Dof	er to plots					
Detector Type:	Peak							er to plots	-				
Jetector Type.	r cak					٧D	w. Keit	a to plots	-				
est Equipmo	ent Used												
Intenna:					Direct	ional Coupl	er:						
re-Amp:						Cable #	¥1:	1045					
ilter:						Cable #	#2:		-				
eceiver:	1464					Cable #			-				
ttenuator #1	1064					Cable #	¥4:						
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Additional equip									-				
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) Notes:	CENTER RBW 30	0k Hz		VBM	30k			PAN 1 SWP			:		
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Data Plot	CDMA	BANDI	EDGE									
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Specification:	part 22		Temperat	ure(°C): 24					-		_	
Tested By:	Chinda Poy		Relative Humi			-						
E.U.T.:	Cell Extende	r		ung(/0) <u>1</u>		_						
Configuration:	Tx Full Powe						_					
Sample Number:							_					
Location:	Lab 2				PRW	: Refer to plots						
	Peak	-				Refer to plots	_					
Detector Type:	Реак	-			V D W	Refer to plots	-					
Test Equipm	ent Used											
Antenna:				Directi	onal Coupler	:						
Pre-Amp:		•			Cable #1		-					
Filter:		-			Cable #2	-	-					
Receiver:	1464	-				:	_					
Attenuator #1	1065	-			Cable #4		-					
Attenuator #2:	1470	•				:	-					
Additional equip					1011ACI		-					
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Notes:			DEDGE (DO									
	-		HANNEL (A-	BLOCK)								
	CHANNEL	L 25 (1931.)	25MHz)									

FCC ID:

PROJECT NO.: 1L0242RUS1

ecification: Part 2: sted By: Chind U.T.: Cell E nfiguration: Tx Fu mple Number:	la Poy Extender	Temperatur Relative Humid	Date: 5/21/01 re(°C): 22					Complete Preliminary	Х	
ecification: Part 2: sted By: Chind U.T.: Cell E nfiguration: Tx Fu mple Number:	4 la Poy Extender	-						Preliminary		
sted By: Chind U.T.: Cell E nfiguration: Tx Fu mple Number:	la Poy Extender	-	re(°C): 22							
U.T.: Cell E nfiguration: Tx Fu mple Number: cation: La tector Type: Pe	Extender	Relative Humid								
nfiguration: <u>Tx Fu</u> mple Number: cation: <u>La</u> tector Type: Pe			ity(%) 50							
mple Number: cation: La tector Type: Pe										
cation: La tector Type: Pe	II Power									
tector Type: Pe										
	ib 2		1	RBW: Refer t	o plots					
	eak		v	BW: Refer t	o plots					
est Equipment Us	sed									
itenna:			Directional Co	upler:						
e-Amp:			Cab	le #1: 1	043					
ter:			Cab	le #2:						
ceiver: 14	464			le #3:						
tenuator #1 10)65			le #4:						
tenuator #2: 14	170		Ν	Aixer:						
lditional equipment us										
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PROJECT NO.: 1L0242RUS1

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Page <u>1</u> o												Complete X	
ob No.:	1L0242R			~	Date: 5/							Preliminary	
pecification:	Part 24			-	ire(°C): 22								
ested By:	Chinda Poy		Rela	tive Humi	dity(%) 50)							
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FCC ID:

PROJECT NO.: 1L0242RUS1

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Page 1 of											Complete X	
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ested By:	Chinda Poy Relative Humidity(%) 50											
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EQUIPMENT:	CE-1819-100 CDMA Cell Extender
FCC ID:	

Section 6. Field Strength of Spurious

NAME OF TEST: Field Strength of Spurious Emissions	PARA. NO.: 2.1051
TESTED BY: Chinda PoyTTidwell	DATE: 5/21/01

Test Results: Complies.

Test Data: See attached table.

Equipment Used: 1016-1484-1485-1464-993

Measurement Uncertainty: +/- 1.7 dB

Temperature: 22 °C

Relative 48 % Humidity:

PROJECT NO.: 1L0242RUS1

Test Data - Radiated Emissions - Uplink



PROJECT NO.: 1L0242RUS1

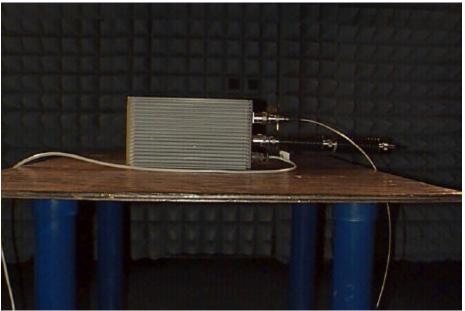
Test Data - Radiated Emissions - Downlink

			Field S	Strength of S	purious l	Emissions			
Page 1 of	f <u>1</u>						Complete	Х	
Job No.:	1L0242R		Date	: 5/21/01			Preliminary	Х	-
Specification:	PART 24		Temperature(°C)	22					-
Tested By:	Chinda Poy	by Relative Humidity(%) 48							
E.U.T.:	CELL EXTENDER			_					
Configuration:	TX FULL POWER								
Sample No:						-			
Location:	AC 2			RBW:	1 MHz		Measurement		
Detector Type:	Peak			VBW:	1 MHz		Distance:	3	m
Test Equipm	ent Used								
Antenna:	993		1	Directional Coupler:					
Pre-Amp:	1016			Cable #1:	1484	•			
Filter:				Cable #2:	1485	•			
Receiver:	1464			Cable #3:		-			
Attenuator #1				Cable #4:		-			
Attenuator #2:				Mixer:		-			
Additional equip	ment used:			-		•			
Measurement Un		+/-3.6 dB							
Frequency	Meter	Correction	Pre-Amp	Substitution		ERP	ERP	Polarity	Comments
	Reading	Factor	Gain	Antenna Gain					
(MHz)	(dBm)	(dB)	(dB)	(dBd)		(dBm)	(mW)		
3880	-35.8	40.4	33.3	8.0		-20.7	0.01	V	
5820	-42.0	38.5	32.8	9.1		-27.2	0.00	v	
7760	-35.3	40.4	33	9.4		-18.4	0.014322	V	
9700	-46.8	40.4	36.1	10.5		-32.0	0.000637	v	
11640	-48.0	-49.3	36.1	11.0		-122.4	0.000000	v	
13580	-57.7	47.6	34.2	10.4		-33.9	0.000411	v	
15520	-60.8	43.2	34.5	13.6		-38.5	0.000	v	NOISE FLOOR
17460	-60.3	47.0	34.7	11.7		-36.2	0.00	v	NOISE FLOOR
19400	-61.2	53.1	34.3	6.4		-36.1	0.000248	v	NOISE FLOOR
10400	01.2	55.1	54.5	0.4		50.1	0.000240	•	NOIDETEOOR
3880	-36.8	34.3	33.3	8.0		-27.8	0.001671	Н	
5820	-37.3	36.0	32.8	9.1		-25.0	0.003133	Н	
7760	-37.7	39.8	33	9.4		-21.5	0.01	Н	
9700	-47.8	42.6	36.1	10.5		-30.8	0.000836	Н	
11640	-47.5	46.0	36.1	11.0		-26.6	0.002208	Н	
13580	-59.0	50.8	34.2	10.4		-32.0	0.000638	Н	NOISE FLOOR
15520	-59.3	44.0	34.5	13.6		-36.2	0.000239	Н	NOISE FLOOR
17460	-60.3	50.5	34.7	11.7		-32.8	0.000528	Н	NOISE FLOOR
19400	-61.5	54.6	34.3	6.4		-34.8	0.000334	Н	NOISE FLOOR
Notes	Scanned to	o the 10th Har	monic						

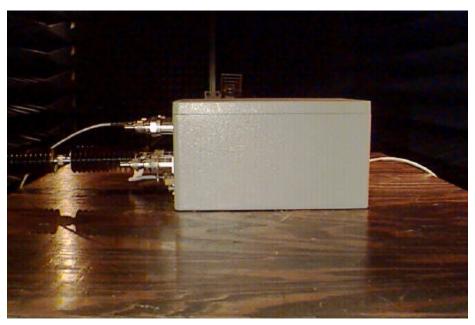
PROJECT NO.: 1L0242RUS1

Photographs of Test Setup

FRONT VIEW



REAR VIEW



PROJECT NO.: 1L0242RUS1

Section 7. **Frequency Stability** NAME OF TEST: Frequency Stability PARA. NO.: 2.1055 TESTED BY: TTidwell DATE: **Test Results:** Complies. Steaded table. Standad est Polecy: Cable Standad est Polecy: MHz **Measurement Data:** NOT Standad Standad **Equipment Used: Measurement Uncertainty:** +/- 1.6 dB Lab Temperature: °C Relative % Humidity:

EQUIPMENT:	CE-1819-100 CDMA Cell Extender
FCC ID:	

Section 8. Test Equipment List

ASSET	Description	Manufacturer Model Number	Serial Number	Cal. Date	Cal. Due
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	01/02/01	01/02/02
993	Horn antenna	A.H. Systems SAS-200/571	XXX	07/16/99	07/16/01
1016	AMPLIFIER	HEWLETT PACKARD 8449A	2749A00159	05/24/00	05/24/01
1484	Cable 2.0-18.0 Ghz	Storm PR90-010-072	N/A	05/25/00	05/25/01
1485	Cable 2.0-18.0 Ghz	Storm PR90-010-216	N/A	05/25/00	05/25/01
1064	ATTENUATOR	NARDA 776B-20	NONE	CBU	N/A
1065	ATTENUATOR	NARDA 776B-10	NONE	CBU	N/A
1045	CABLE 2m	Astrolab Inc. 32027-2-29094-72TC	N/A	05/23/00	05/23/01

EQUIPMENT:	CE-1819-100 CDMA Cell Extender
FCC ID:	

ANNEX A - TEST DETAILS

FCC PART 24, SUBPART E BROADBAND PCS REPEATERS

EQUIPMENT: CE-1819-100 CDMA Cell Extender *FCC ID:*

PROJECT NO.: 1L0242RUS1

NAME OF TEST: RF Power OutputPARA. NO.: 2.1046

Minimum Standard: Para. No.24.232. Base stations are limited to 1640 watts peak E.I.R.P. with an antenna height up to 300 meters HAAT. In no case may the peak output power of a base station transmitter exceed 100 watts.

Method Of Measurement:

Detachable Antenna:

The peak power at antenna terminals is measured using an in-line peak power meter. Power output is measured with the maximum rated input level.

Integral Antenna:

If the antenna is not detachable from the circuit then the Peak Power Output is derived from the peak radiated field strength of the fundamental emission by using the plane wave relation GP/4 π R² = E²/120 π and proceeding as follows:

$$P = \frac{E^2 R^2}{30G} = \frac{E^2 3^2}{30G}$$

where,

P = the equivalent isotropic radiated power in watts

E = the maximum measured field strength in V/m

R = the measurement range (3 meters)

G = the numeric gain of the transmit antenna in relation to an isotropic radiator

FCC PART 24, SUBPART E BROADBAND PCS REPEATERS

EQUIPMENT: CE-1819-100 CDMA Cell Extender *FCC ID:*

PROJECT NO.: 1L0242RUS1

NAME OF TEST: Occupied Bandwidth

PARA. NO.: 2.1047

Minimum Standard: Para. No. 24.238(b). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB.

Method Of Measurement:

<u>CDMA</u>

Spectrum analyzer settings: RBW: 30 kHz VBW: ≥ RBW Span: 5 MHz Sweep: Auto Mask: Set markers to -26 dB from peak of CW.

GSM

RBW: 3 kHzVBW: \geq RBW Span: 2 MHzSweep: Auto Mask: Set markers to -26 dB from peak of CW.

<u>NADC</u>

RBW: 1 kHz VBW: ≥ RBW Span: 1 MHz Sweep: Auto Mask: Set markers to -26 dB from peak of CW.

PROJECT NO.: 1L0242RUS1

NAME OF TEST: Spurious Emission at Antenna Terminals PARA. NO.: 2.1051

Minimum Standard: Para. No.24.238(a). On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power by at least 43 + 10 log (P) dB.

Method Of Measurement:

Spectrum analyzer settings:

<u>CDMA</u>

RBW: 1 MHz (> 1 MHz from Band Edge) RBW: 30 kHz (< 1MHz from Band Edge) VBW: ≥ RBW Sweep: Auto Video Avg: 6 Sweeps

<u>NADC</u>

RBW: 1 MHz (> 1 MHz from Band Edge) RBW: 3 kHz (< 1 MHz from Band Edge) VBW: ≥ RBW Sweep: Auto Video Avg: Disabled

<u>GSM</u>

RBW: 1 MHz (> 1 MHz from Band Edge) RBW: 3 kHz (< 1 MHz from Band Edge) VBW: ≥ RBW Sweep: Auto Video Avg: Disabled

To demonstrate compliance at band edges the frequency of the input signal is set to the lowest and highest assigned channel and the center frequency of the spectrum analyzer is set to the upper and lower edges of the appropriate frequency block.

PROJECT NO.: 1L0242RUS1

NAME OF TEST: Field Strength of Spurious Radiation PARA. NO.: 2.1053

Minimum Standard:Para. No.24.238(a). On any frequency outside a licensee's
frequency block, the power of any emission shall be attenuated
below the transmitter power by at least 43 + 10 log (P) dB.

Calculation Of Field Strength Limit

An example of attenuation requirement of 43 + 10 Log P is equivalent to $-13 \text{ dBm} (5 \times 10^{-5} \text{ Watts})$ at the antenna terminal. We determine the field strength limit by using the plane wave relation.

 $GP/4\pi R^2 = E^2/120\pi$

For emissions ≤ 1 GHz:

G = 1.64 (Dipole Gain) $P = 10^{-5}$ Watts (Maximum spurious output power) R = 3m (Measurement Distance)

$$E = \frac{\sqrt{30GP}}{R}$$
$$E = \frac{\sqrt{30 \times 1.64 \times 5 \times 10^{-5}}}{3} = 0.016533 \text{ V/m} = 84.4 \text{ dB}\text{mV/m}$$

For emissions > 1 GHz:

G = 1 (Isotropic Gain) $P = 1 \times 10^{-5}$ Watts (Maximum spurious output power) R = 3m (Measurement Distance)

$$E = 84.4 - 20 \log \sqrt{1.64} = 82.3 dB \,\mathrm{mV} / m@3m$$

PROJECT NO.: 1L0242RUS1

Minimum Standard: Para. No. 24.235. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Method Of Measurement:

Frequency Stability With Voltage Variation

The E.U.T. is placed in an environmental chamber and allowed to stabilize at +20 degrees Celsius for at least 15 minutes. The frequency counter and signal generator are phase locked with the same 10 MHz reference frequency by connecting the 10 MHz ref. out of the counter to the 10 MHz ref, in of the signal generator. With the voltage input to the E.U.T. set to 85% S.T.V., the frequency is measured in 30 second intervals for a period of 5 minutes. This procedure is repeated at 100% S.T.V. and 115% S.T.V.

Frequency Stability With Temperature Variation

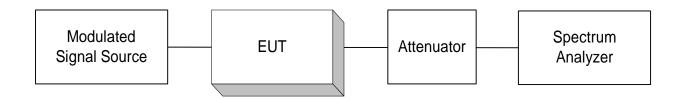
The input voltage to the E.U.T. is set to S.T.V. and the temperature of the environmental chamber is varied in 10 degree steps from -30 degrees C to +50 degrees C. The E.U.T. is allowed to stabilize at each temperature and the frequency is measured in 30 second intervals for a period of 5 minutes.

EQUIPMENT:	CE-1819-100 CDMA Cell Extender
FCC ID:	

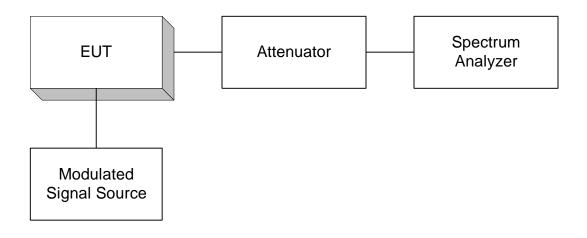
ANNEX B - TEST DIAGRAMS

PROJECT NO.: 1L0242RUS1

Para. No. 2.985 - R.F. Power Output

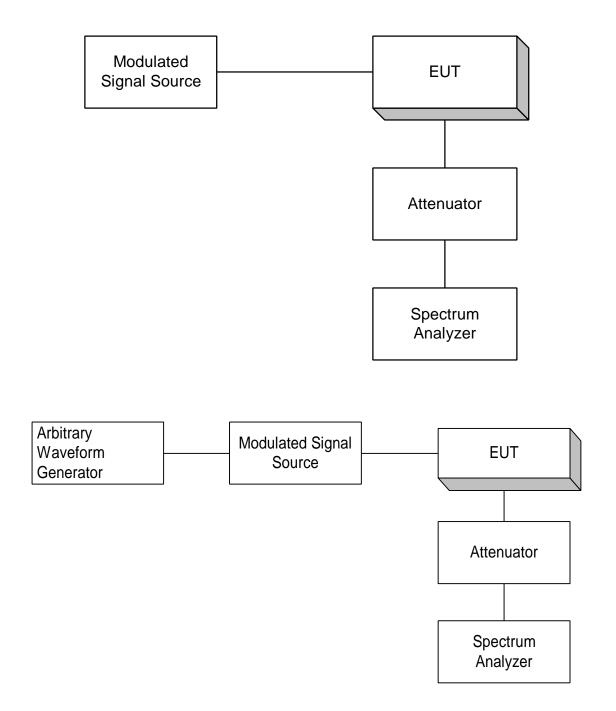


Para. No. 2.989 - Occupied Bandwidth



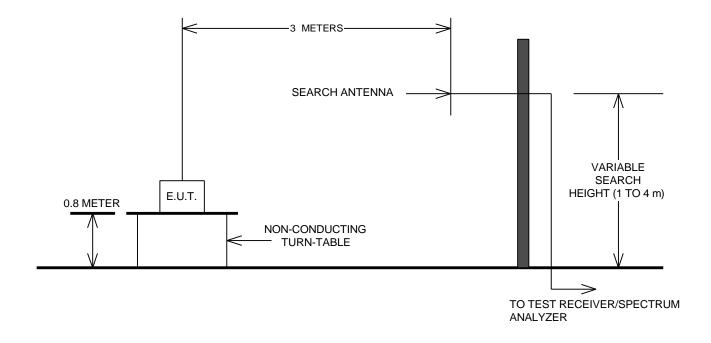
EQUIPMENT:	CE-1819-100 CDMA Cell Extender
FCC ID:	

Para. No. 2.991 Spurious Emissions at Antenna Terminals



EQUIPMENT:	CE-1819-100 CDMA Cell Extender
FCC ID:	

Para. No. 2.993 - Field Strength of Spurious Radiation



Para. No. 2.995 - Frequency Stability

