

**KTL Test Report:** 0L0278RUS1

**Applicant:** Nextcell  
661 E. 18<sup>th</sup> Street  
Plano, TX 75074

**Equipment Under Test:** Pocket Spider CDPD Modem  
**(E.U.T.)**

**FCC ID:** MIVCDP06PS

**In Accordance With:** FCC Part 22, Subpart H  
800 MHz Cellular Subscriber Units

**Tested By:** KTL Dallas Inc.  
802 N. Kealy  
Lewisville, TX  
75057-3136

**Authorized By:**   
Tom Tidwell, RF Group Manager

**Date:** 10/13/00

**Total Number of Pages:** 39

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**Section 1. Summary of Test Results**

Manufacturer: **NEXTCELL**

Model No.: **POCKET SPIDER**

Serial No.: **Sample 1**

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 22, Subpart H.



New Submission



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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*EQUIPMENT: Pocket Spider CDPD Modem**FCC ID: MIVCDP06PS**PROJECT NO.: 0L0278RUS1***Summary Of Test Data**

NAME OF TEST	PARA. NO.	SPEC.	MEAS.	RESULT
RF Power Output	2.1046	7W ERP	+28.37	Complies
Audio Frequency Response	2.1047	6dB/Octave	N/A	NA
Audio Low Pass Filter Response	2.1047	Graph	N/A	NA
Modulation Limiting	2.1047	Graph	N/A	NA
Occupied Bandwidth (Voice & SAT)	2.1049	Mask	N/A	NA
Occupies Bandwidth (WB Data & SAT)	2.1049	Mask	N/A	NA
Occupied Bandwidth (ST)	2.1049	Mask	N/A	NA
Occupied Bandwidth (SAT)	2.1049	Mask	N/A	NA
Occupied Bandwidth (SAT)	2.1049	Not Specified	N/A	NA
Transmitter Spurious Emissions at Antenna Terminals (Receive Band)	22.197(f)	-80 dBm	-90.8 dBm	Complies
Transmitter Field Strength of Spurious Emissions	2.1053	-13 dBm erp	-25 dBm erp	Complies
Frequency Stability	2.1055	2.5 ppm	1.73 ppm	Complies

**Footnotes:**

1. The E.U.T. does not support voice modulation. The only modulation available is CDPD(Cellular Digital Packet Data). Consequently, tests relating to the audio processing circuitry were not performed.

**Section 2. General Equipment Specification**

**Frequency Range:** 824 MHz to 849 MHz TX  
869 MHz to 894 MHz RX

**Tunable Bands:** 1

**Necessary Bandwidth:** 30kHz

**Type of Modulation and Designator:** GMSK, 40K0GXW

**Output Impedance:** 50 ohms

**RF Power Output (rated):** +28dBm maximum

**Duty Cycle:** Continuous

**Channel Spacing:** 30 kHz

**Operator Selection of Frequency:** Software Controlled. Not user selectable.

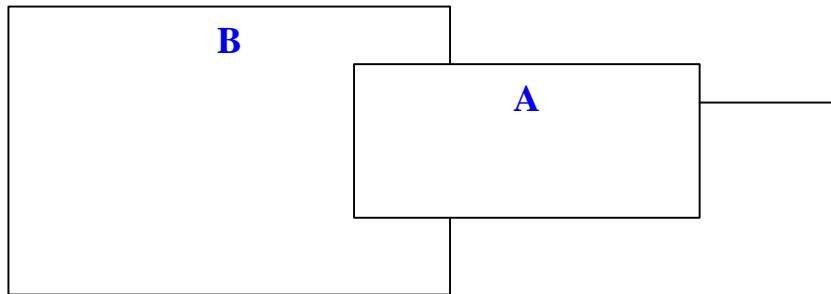
**Power Output Adjustment Capability:** Software Controlled. Not user selectable

*EQUIPMENT: Pocket Spider CDPD Modem**FCC ID: MIVCDP06PS**PROJECT NO.: 0L0278RUS1***Operational Description**

The Cellular Digital Packet Data (CDPD) network is a two-way wireless data communication system. This system uses cellular telephone channels to transfer data seamlessly from a mobile end system.

**System Diagram**

- A. Pocket Spider modem (E.U.T.)
- B. Handheld computer



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FCC PART 22, SUBPART H  
800 MHz CELLULAR SUBSCRIBER  
UNITS

*EQUIPMENT: Pocket Spider CDPD Modem*

*FCC ID: MIVCDP06PS*

PROJECT NO.: **0L0278RUS1**

### **Section 3. RF Power Output**

NAME OF TEST: RF Power Output	PARA. NO.: 2.1046
TESTED BY: David Light	DATE: 8-17-00

**Test Results:** *Complies.*

#### **Measurement Data:**

Channel	Output Power (dBm) erp	Rated Power (dBm) erp	Measured / Rated (dB)
836.01	28.37	+28.0 max.	.037

**Equipment Used:** *1036, 1065*

**Measurement Uncertainty:** *+/- 1.05 dB*

**Temperature:** *21 °C*

**Relative  
Humidity:** *46 %*

**Section 4. Modulation Characteristics**

NAME OF TEST: Modulation Characteristics Audio Frequency Response	PARA. NO.: 2.1047
TESTED BY:	DATE:

**Test Results:** Complies.**Measurement Data:** Specified g**Equipment Used:****Measurement Uncertainty:** dB**Temperature:** °C**Relative  
Humidity:** %**Not Applicable**

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*FCC ID: MIVCDP06PS*

PROJECT NO.: **0L0278RUS1**

NAME OF TEST: Modulation Characteristics Audio Low-Pass Filter Response	PARA. NO.: 2.1047
TESTED BY:	DATE:

**Test Results:** Complies.

**Measurement Data:** See attached report.

**Equipment Used:**

**Not Applicable**

**Measurement Uncertainty:** dB

**Temperature:** °C

**Relative  
Humidity:** %

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*EQUIPMENT: Pocket Spider CDPD Modem*

*FCC ID: MIVCDP06PS*

PROJECT NO.: **0L0278RUS1**

NAME OF TEST: Modulation Characteristics Modulation Limiting	PARA. NO.: 2.1047
TESTED BY:	DATE:

**Test Results:** Complies.

**Measurement Data:** See attached graph

Equipment U

**Not Applicable**

**Measurement Uncertainty:** kHz

**Temperature:** °C

**Relative  
Humidity:** %

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*EQUIPMENT: Pocket Spider CDPD Modem*

*FCC ID: MIVCDP06PS*

*PROJECT NO.: 0L0278RUS1*

NAME OF TEST: Modulation Characteristics Digital Modulation	PARA. NO.: 2.1047
TESTED BY: Kevin Rose	DATE: 8-17-00

**Test Results:** Complies.

**Measurement Data:** The transmitter is a digitally modulated GMSK waveform. The channel occupation due to modulation is not changed with the modulation information.

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*EQUIPMENT: Pocket Spider CDPD Modem*

*FCC ID: MIVCDP06PS*

PROJECT NO.: **0L0278RUS1**

## **Section 5. Occupied Bandwidth**

NAME OF TEST: Occupied Bandwidth (Voice + SAT)	PARA. NO.: 2.1047
TESTED BY:	DATE:

**Test Results:** Complies.

Measurement tolerance: See above

**Not Applicable**

**Equipment Used:**

**Measurement Uncertainty:** dB

**Temperature:** °C

**Relative  
Humidity:** %

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*EQUIPMENT: Pocket Spider CDPD Modem*

*FCC ID: MIVCDP06PS*

PROJECT NO.: **0L0278RUS1**

NAME OF TEST: Occupied Bandwidth (ST)

PARA. NO.: 2.1047

TESTED BY:

DATE:

**Test Results:**

**Not Applicable**

**Measurement Data:** See attached graph.

**Equipment Used:**

**Measurement Uncertainty:** dB

**Temperature:** °C

**Relative  
Humidity:** %

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*EQUIPMENT: Pocket Spider CDPD Modem*

*FCC ID: MIVCDP06PS*

PROJECT NO.: **0L0278RUS1**

NAME OF TEST: Occupied Bandwidth  
(Wideband Data)

PARA. NO.: 2.1047

TESTED BY:

DATE:

**Test Results:** Complies.

**Measurement Data:** See attached graph.

**Equipment Use**

**Not Applicable**

**Measurement Uncertainty:** dB

**Temperature:** °C

**Relative  
Humidity:** %

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800 MHz CELLULAR SUBSCRIBER  
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*EQUIPMENT: Pocket Spider CDPD Modem*

*FCC ID: MIVCDP06PS*

*PROJECT NO.: 0L0278RUS1*

NAME OF TEST: Occupied Bandwidth  
(Digital Modulation)

PARA. NO.: 2.1047

TESTED BY: Kevin Rose

DATE: 8-17-00

**Test Results:** Complies.

**Measurement Data:** See attached graph.

**Measurement Uncertainty:** +/- 1.04 dB

**Temperature:** 21 °C

**Relative  
Humidity:** 46 %

EQUIPMENT: *Pocket Spider CDPD Modem*FCC ID: *MIVCDP06PS*PROJECT NO.: *OL0278RUS1***Test Plot: SPECTRAL MASK**

Page 1 of 1

Job No.: OL0278R Date: 08/17/00

Specification: PART 22.197 (d) Temperature(°C): 21

Tested By: Kevin Rose Relative Humidity(%) 46

E.U.T.:

Configuration: TRANSMIT AT 836.01 MHZ low power

Serial Number:

Location: Lab 1 RBW: 300HZ

Detector Type: Peak VBW: 300HZ

Complete Preliminary **Test Equipment Used**

Antenna: #N/A Directional Coupler: #N/A

Pre-Amp: #N/A Cable #1: 1046

Filter: #N/A Cable #2: #N/A

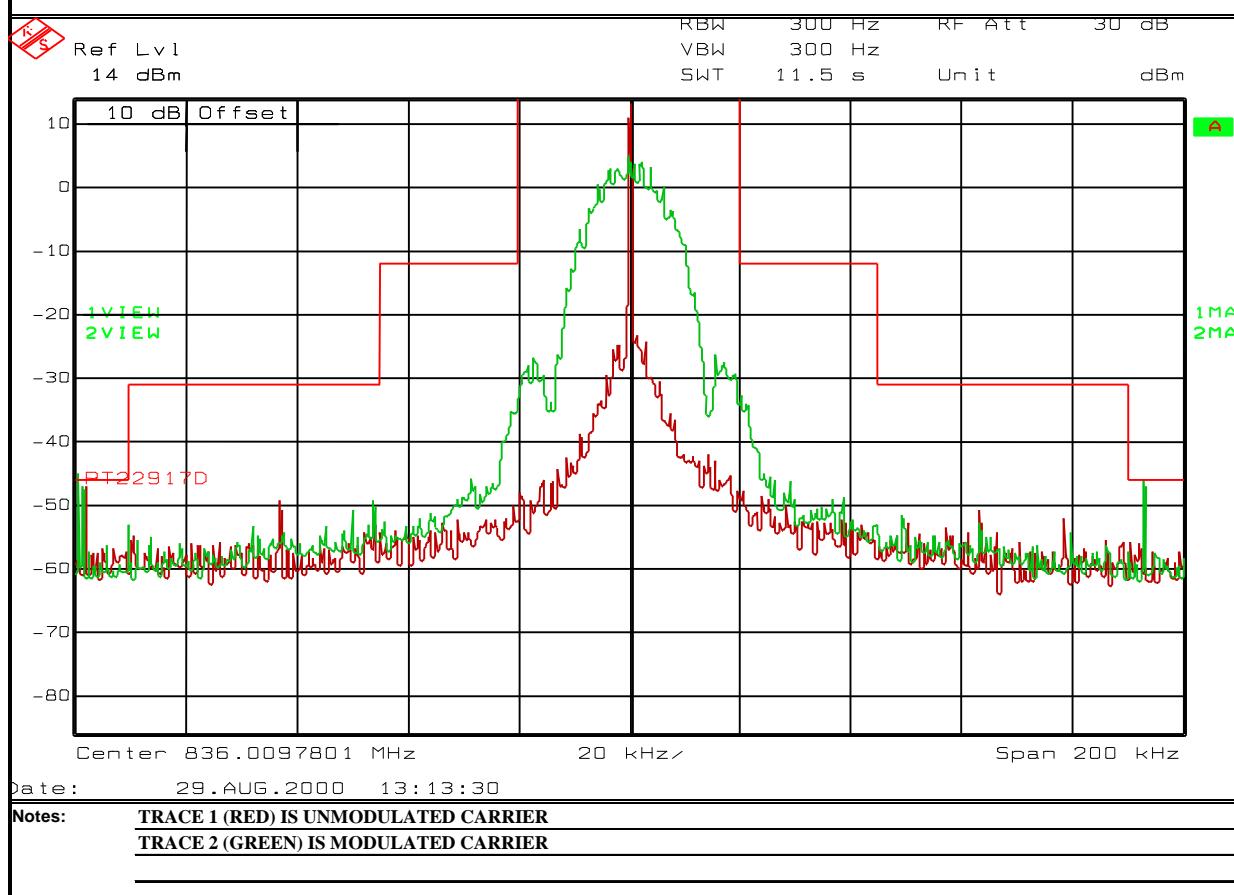
Receiver: 1036 Cable #3: #N/A

Attenuator #1: #N/A Cable #4: #N/A

Attenuator #2: #N/A Mixer: #N/A

Additional equipment used:

Measurement Uncertainty: #N/A



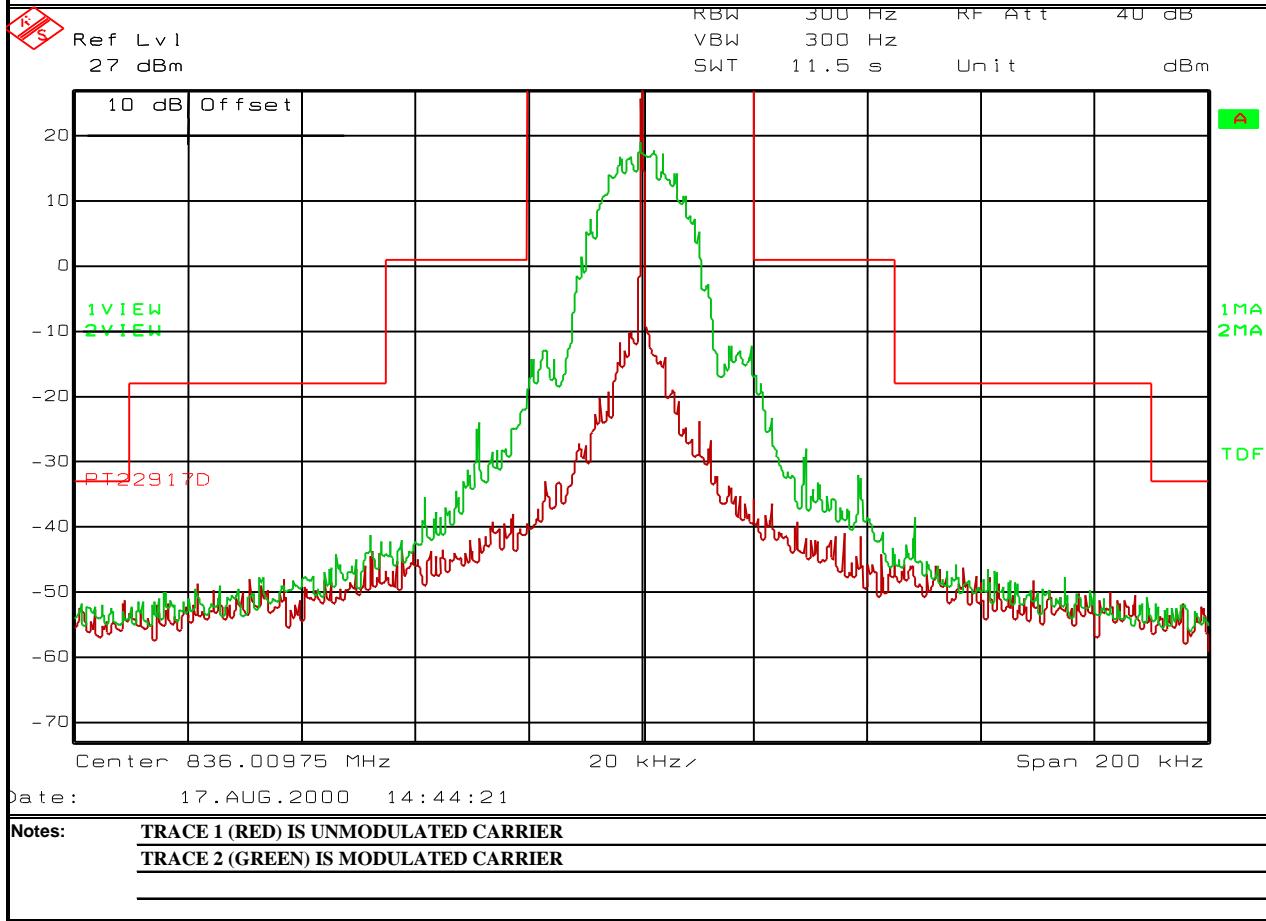
EQUIPMENT: *Pocket Spider CDPD Modem*FCC ID: *MIVCDP06PS*PROJECT NO.: *0L0278RUS1***Test Plot: SPECTRAL MASK**Page 1 of 1

Job No.: 0L0278R Date: 08/17/00  
 Specification: PART 22.197 (d) Temperature(°C): 22  
 Tested By: David Light Relative Humidity(%) 50  
 E.U.T.:  
 Configuration: TRANSMIT AT 836.01 MHZ  
 Serial Number:  
 Location: Lab 1 RBW: 300HZ  
 Detector Type: Peak VBW: 300HZ

Complete  X  
Preliminary **Test Equipment Used**

Antenna:	#N/A	Directional Coupler:	#N/A
Pre-Amp:	#N/A	Cable #1:	1046
Filter:	#N/A	Cable #2:	#N/A
Receiver:	1036	Cable #3:	#N/A
Attenuator #1	#N/A	Cable #4:	#N/A
Attenuator #2:	#N/A	Mixer:	#N/A

Additional equipment used:  
 Measurement Uncertainty: #N/A



*EQUIPMENT: Pocket Spider CDPD Modem**FCC ID: MIVCDP06PS**PROJECT NO.: 0L0278RUS1***Section 6. Spurious Emissions at Antenna Terminals**

NAME OF TEST: Spurious Emissions At Antenna Terminals	PARA. NO.: 2.1051
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TESTED BY: David Light	DATE: 8-17-00
------------------------	---------------

**Test Results:** Complies.

**Measurement Data:** See attached graph.

**NOTE:** The equipment under test has an integral antenna. Spurious emissions in the transmit band were measured as erp. Spurious emissions in the receive band were measured using a temporary 50 ohm connection so as to achieve a noise floor of -100 dBm in the test setup.

**Measurement Uncertainty:** +/-1.04 dB

**Temperature:** 22 °C

**Relative Humidity:** 50 %

EQUIPMENT: *Pocket Spider CDPD Modem*FCC ID: *MIVCDP06PS*PROJECT NO.: *0L0278RUS1***Test Plot: 22.197(f)**

Page <u>1</u> of <u>1</u>		Complete <u>      </u>
Job No.:	0L0278R	Date: 08/17/00
Specification:	PART 22.197 (f)	Temperature(°C): 22
Tested By:	David Light	Relative Humidity(%) 50
E.U.T.:		
Configuration:	TRANSMIT AT 836.01 MHZ	
Serial Number:		
Location:	Lab 1	RBW: 300HZ
Detector Type:	Peak	VBW: 300HZ
<b>Test Equipment Used</b>		
Antenna:	#N/A	
Pre-Amp:	#N/A	
Filter:	#N/A	
Receiver:	1036	
Attenuator #1	#N/A	
Attenuator #2:	#N/A	
Additional equipment used:		
Measurement Uncertainty:	#N/A	

Ref Lvl 1 -13 dBm      Marker 1 [T1] -90.82 dBm 870.20240481 MHz      RBW 10 kHz      RF Att 0 dB  
VBW 10 kHz      SWT 640 ms      Unit      dBm

Center 881.5 MHz      2.5 MHz      Span 25 MHz

Date: 17.AUG.2000 14:57:14

Notes:

*EQUIPMENT: Pocket Spider CDPD Modem**FCC ID: MIVCDP06PS**PROJECT NO.: 0L0278RUS1***Section 7. Field Strength of Spurious**

NAME OF TEST: Field Strength of Spurious	PARA. NO.: 2.1053
TESTED BY: David Light	DATE: 8/17/2000

**Test Results:** Complies. The worst-case emission level was -25 dBm at 2.508 GHz. This is 53.4 dB below the peak measured fundamental erp.**Measurement Data:** See attached table.**Measurement Uncertainty:** +/- *3.6* dB**Temperature:** *22* °C**Relative Humidity:** *50* %

EQUIPMENT: *Pocket Spider CDPD Modem*FCC ID: *MIVCDP06PS*PROJECT NO.: *0L0278RUS1***Test Data - Radiated Emissions**

Field Strength of Spurious Emissions											
Page <u>1</u> of <u>1</u>											
Job No.:	<u>0L0278R</u>		Date:	<u>8/17/00</u>		Complete <input checked="" type="checkbox"/>					
Specification:	<u>Part 22</u>		Temperature(°C):	<u>22</u>		Preliminary <input type="checkbox"/>					
Tested By:	<u>David Light</u>		Relative Humidity(%)	<u>50</u>							
E.U.T.:											
Configuration:	<u>Transmit @ 806.01 MHz</u>					Fundamental erp(dBm): <u>28.37</u>					
Sample Number:											
Location:	<u>AC 3</u>		RBW:	<u>1 MHz</u>							
Detector Type:	<u>Peak</u>		VBW:	<u>1 MHz</u>		Measurement Distance <u>3 m</u>					
Test Equipment Used											
Antenna:	<u>1480</u>		Directional Coupler:	<u>#N/A</u>							
Pre-Amp:	<u>1016</u>		Cable #1:	<u>1484</u>							
Filter:	<u>#N/A</u>		Cable #2:	<u>1485</u>							
Receiver:	<u>1464</u>		Cable #3:	<u>#N/A</u>							
Attenuator #1	<u>#N/A</u>		Cable #4:	<u>#N/A</u>							
Attenuator #2:	<u>#N/A</u>		Mixer:	<u>#N/A</u>							
Additional equipment used:	<u>993</u>										
Measurement Uncertainty:	<u>+/-3.6 dB</u>										
Frequency (GHz)	Meter Reading (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Pre-Amp Gain (dB)	Corrected Reading (dBuV/m)	ERP (W)	ERP (dBm)	dBc	Polarity	Comments	
<u>0.836</u>	<u>88.3</u>	<u>23.5</u>	<u>1.6</u>	<u>0</u>	<u>113</u>	<u>0.07</u>	<u>18.17</u>		Vertical	Fundamental	
<u>1.672</u>	<u>61</u>	<u>25.9</u>	<u>1.6</u>	<u>31.6</u>	<u>57</u>	<u>0.00</u>	<u>-38.33</u>	<u>-66.70</u>	Vertical		
<u>2.508</u>	<u>70</u>	<u>29</u>	<u>3.1</u>	<u>32.2</u>	<u>70</u>	<u>0.00</u>	<u>-25.33</u>	<u>-53.70</u>	Vertical		
<u>3.344</u>	<u>62.5</u>	<u>29.8</u>	<u>3.4</u>	<u>32.3</u>	<u>63</u>	<u>0.00</u>	<u>-31.83</u>	<u>-60.20</u>	Vertical		
<u>4.181</u>	<u>59.8</u>	<u>31.7</u>	<u>4</u>	<u>31.4</u>	<u>64</u>	<u>0.00</u>	<u>-31.13</u>	<u>-59.50</u>	Vertical		
<u>5.017</u>	<u>50.7</u>	<u>33.8</u>	<u>4.3</u>	<u>29.5</u>	<u>59</u>	<u>0.00</u>	<u>-35.93</u>	<u>-64.30</u>	Vertical		
<u>5.852</u>	<u>51.8</u>	<u>34.2</u>	<u>4.8</u>	<u>30.4</u>	<u>60</u>	<u>0.00</u>	<u>-34.83</u>	<u>-63.20</u>	Vertical		
<u>6.688</u>	<u>52.2</u>	<u>35.4</u>	<u>5.2</u>	<u>32.6</u>	<u>60</u>	<u>0.00</u>	<u>-35.03</u>	<u>-63.40</u>	Vertical		
<u>7.525</u>	<u>47.2</u>	<u>36</u>	<u>5.3</u>	<u>34</u>	<u>55</u>	<u>0.00</u>	<u>-40.73</u>	<u>-69.10</u>	Vertical		
<u>8.36</u>	<u>47</u>	<u>37.1</u>	<u>5.6</u>	<u>33.2</u>	<u>57</u>	<u>0.00</u>	<u>-38.73</u>	<u>-67.10</u>	Vertical		
<u>0.836</u>	<u>98.5</u>	<u>23.5</u>	<u>1.6</u>	<u>0</u>	<u>124</u>	<u>0.69</u>	<u>28.37</u>		Horizontal	Fundamental erp(max.)	
<u>1.672</u>	<u>67</u>	<u>25.9</u>	<u>1.6</u>	<u>31.6</u>	<u>63</u>	<u>0.00</u>	<u>-32.33</u>	<u>-60.70</u>	Horizontal		
<u>2.508</u>	<u>70.3</u>	<u>29</u>	<u>3.1</u>	<u>32.2</u>	<u>70</u>	<u>0.00</u>	<u>-25.03</u>	<u>-53.40</u>	Horizontal		
<u>3.344</u>	<u>52.7</u>	<u>29.8</u>	<u>3.4</u>	<u>32.3</u>	<u>54</u>	<u>0.00</u>	<u>-41.63</u>	<u>-70.00</u>	Horizontal		
<u>4.181</u>	<u>55</u>	<u>31.7</u>	<u>4</u>	<u>31.4</u>	<u>59</u>	<u>0.00</u>	<u>-35.93</u>	<u>-64.30</u>	Horizontal		
<u>5.017</u>	<u>46.7</u>	<u>33.8</u>	<u>4.3</u>	<u>29.5</u>	<u>55</u>	<u>0.00</u>	<u>-39.93</u>	<u>-68.30</u>	Horizontal		
<u>5.852</u>	<u>47.3</u>	<u>34.2</u>	<u>4.8</u>	<u>30.4</u>	<u>56</u>	<u>0.00</u>	<u>-39.33</u>	<u>-67.70</u>	Horizontal		
<u>6.688</u>	<u>50.7</u>	<u>35.4</u>	<u>5.2</u>	<u>32.6</u>	<u>59</u>	<u>0.00</u>	<u>-36.53</u>	<u>-64.90</u>	Horizontal		
<u>7.525</u>	<u>46.5</u>	<u>36</u>	<u>5.3</u>	<u>34</u>	<u>54</u>	<u>0.00</u>	<u>-41.43</u>	<u>-69.80</u>	Horizontal		
<u>8.36</u>	<u>43</u>	<u>37.1</u>	<u>5.6</u>	<u>33.2</u>	<u>53</u>	<u>0.00</u>	<u>-42.73</u>	<u>-71.10</u>	Horizontal		
Notes: _____ Scanned to the 10th harmonic											

*EQUIPMENT: Pocket Spider CDPD Modem*

*FCC ID: MIVCDP06PS*

PROJECT NO.: [0L0278RUS1](#)

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**Photographs of Test Setup**

FRONT VIEW



REAR VIEW



**Section 8. Frequency Stability**

NAME OF TEST: Frequency Stability	PARA. NO.: 2.1055
TESTED BY: Kevin Rose	DATE: 8/29/2000

**Test Results:** Complies. The maximum frequency drift is 1.732 ppm.**Measurement Data:** See attached table.**Equipment Used:** 1082, 0686, 1026**Measurement Uncertainty:**  $1 \times 10^{-7}$  ppm

EQUIPMENT: *Pocket Spider CDPD Modem*FCC ID: *MIVCDP06PS*PROJECT NO.: *0L0278RUS1***Frequency Stability**Client: NEXTCELLW.O.# 0L0278REUT: POCKET SPIDERS/N: Sample 1Date: AUG 29 2000Tech: Kevin RoseStandard Frequency: 836.010000 MHzNominal Voltage: 3.7 Vdc

Temperature	Voltage	Rho	Measured Frequency (MHz)
20 °C	3.7VDC		836 009 753
20 °C	(-15%) 3.145VDC		836 009 753
20 °C	(+15%) 4.255VDC		836 009 753
10 °C	3.7VDC		836 009 453
0 °C	3.7VDC		836 009 223
-10 °C	3.7VDC		836 008 933
-20 °C	3.7VDC		836 008 743
-30 °C	3.7VDC		836 008 552
30 °C	3.7VDC		836 009 909
40 °C	3.7VDC		836 010 143
50 °C	3.7VDC		836 010 506
506 HZ AT +50 DEGREES = 0.605 PPM			
1448 HZ AT -30 DEGREES = 1.732 PPM			

*EQUIPMENT: Pocket Spider CDPD Modem*

FCC ID: MIVCDP06PS

PROJECT NO.: 0L0278RUS1

**Section 9. Test Equipment List**

<b>KTL ID</b>	<b>Description</b>	<b>Manufacturer</b> <b>Model Number</b>	<b>Serial Number</b>	<b>Calibration Due Date</b>
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	06/14/01
1046	Flex cable 1m	Astrolab Inc. 32022-2-29094K-1M	N/A	09/30/00
1480	Bi-Log Antenna	Schaffner-Chase CBL6111C	2572	01/14/01
1016	AMPLIFIER	HEWLETT PACKARD 8449A	2749A00159	05/24/01
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	11/03/00
1484	Cable 0 -18.0 GHz	Storm PR90-010-072	N/A	05/25/01
1485	Cable 0 -18.0 GHz	Storm PR90-010-216	N/A	05/25/01
993	Horn antenna	A.H. Systems SAS-200/571	XXX	07/16/01
1065	ATTENUATOR	NARDA 776B-10	NONE	09/30/00
1082	CABLE 2m	Astrolab 32027-2-29094-72TC	N/A	05/23/01
1026	FREQUENCY COUNTER	HEWLETT PACKARD 5350B	8232A01493	08/17/01
686	Power Supply	Hewlett Packard 6206B	1145A04253	CNR

**KTL Dallas**

FCC PART 22, SUBPART H  
800 MHz CELLULAR SUBSCRIBER  
UNITS

*EQUIPMENT: Pocket Spider CDPD Modem*

*FCC ID: MIVCDP06PS*

*PROJECT NO.: OL0278RUS1*

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## **ANNEX A - TEST DETAILS**

*EQUIPMENT: Pocket Spider CDPD Modem**FCC ID: MIVCDP06PS***PROJECT NO.: 0L0278RUS1****NAME OF TEST: RF Power Output****PARA. NO.: 1.1046**

**Minimum Standard:** Para. No. 22.913(a). The E.R.P. of mobile transmitter and auxiliary test transmitter must not exceed 7 watts.

EIA is 19B Para. No. 3.2.1.3. The transmitter shall be compiled of 8 distinct power levels.

The output power shown above shall be maintained within the range of +2 dB, -4 dB of nominal dBW value

<b>PL</b>	<b>I</b>	<b>II</b>	<b>III</b>
0	+6	+2	-2
1	+2	+2	-2
2	-2	-2	-2
3	-6	-6	-6
4	-10	-10	-10
5	-14	-14	-14
6	-18	-18	-18
7	-22	-22	-22

**Method Of Measurement:**Detachable Antenna:

The power at antenna terminals is measured using an in-line power meter.

Integral Antenna:

If the antenna is not detachable from the circuit then the Power Output is derived from the radiated field strength of the fundamental emission by using the plane wave relation  $GP/4\pi R^2 = E^2/120\pi$  and proceeding as follows:

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

where,

P = the equivalent 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 a halfwave dipole antenna

*EQUIPMENT: Pocket Spider CDPD Modem**FCC ID: MIVCDP06PS**PROJECT NO.: OL0278RUS1***NAME OF TEST: Audio Frequency Response****PARA. NO.: 2.1047**

**Minimum Standard:** Para. No. 15-19-B. From 300 to 3000 Hz the audio frequency response shall not vary more than +1 to -3 dB from a true 6dB octave pre-emphasis characteristic as referred to 1000 Hz level (with the exception of a permissible 6dB per octave roll-off from 2500 to 3000 Hz).

**Method Of Measurement:**

Operate the transmitter with the compressor disabled, and monitor the output with a frequency deviation meter or standard test receiver without standard 750-microsecond de-emphasis, with expander disabled, and without C-message weighted filter (see 6.6.2). Apply a sine wave audio input to the transmitter external audio input port, vary the modulating frequency from 300 to 3000 Hz and observe the input levels necessary to maintain a constant  $\pm 2.9$  kHz system deviation.

**EQUIPMENT:** *Pocket Spider CDPD Modem***FCC ID:** *MIVCDP06PS***PROJECT NO.:** *0L0278RUS1***NAME OF TEST:** **Audio Low Pass Filter Response****PARA. NO.:** **2.1047**

**Minimum Standard:** Para. No. 22.915 (d). For mobile stations, signals must be attenuated as a function of frequency as follows:

- i. In the frequency ranges 3.0 to 5.9 Hz and 6.1 to 15 kHz,  $40 \log(f/3)$  dB.
- ii. In the frequency range 5.9 to 6.1 kHz, 35 dB
- iii. In the frequency range above 15 kHz, 28 dB.

**Method Of Measurement:**

Adjust the audio input frequency to 1000 Hz and adjust the input level to 20 dB greater than that required to produce  $\pm 8$  kHz deviation. Note the output level on the frequency deviation meter or standard test receiver. Using the output level as reference (0dB), vary the modulating frequency from 3000 Hz to 30,000 Hz and observe the change in output while maintaining a constant audio input level.

*EQUIPMENT: Pocket Spider CDPD Modem**FCC ID: MIVCDP06PS**PROJECT NO.: OL0278RUS1***NAME OF TEST: Modulation Limiting****PARA. NO.: 2.1047****Minimum Standard:** Para. No. 22.915(b)

The levels of the modulating signals must be set to the values specified below and must be maintained within  $\pm 10\%$  of these values.

Voice:  $\pm 12$  kHzSAT:  $\pm 2$  kHzWideband Data:  $\pm 8$  kHzST:  $\pm 8$  kHz**Method Of Measurement:**

Voice: A 1 kHz audio tone is injected at levels between -45 and +20 dBVrms. The peak deviation is noted. This is repeated with a 300 Hz tone and a 3 kHz tone.

SAT: A SAT tone is generated by the mobile station and the peak deviation is measured.

Wideband Data: Wideband data is generated by the mobile station and the peak deviation is measured.

ST: ST data is generated by the mobile station and the peak deviation is measured.

<b>NAME OF TEST: Occupied Bandwidth (Voice &amp; SAT)</b>	<b>PARA. NO.: 2.1049</b>
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**Minimum Standard:** 22.917(b) The mean power of any emission removed from the carrier frequency by a displacement frequency ( $f_d$  in kHz) must be attenuated below the mean power of the unmodulated carrier (P) as follows:

- (i) On any frequency removed from the carrier frequency by more than 20 kHz but not more than 45 kHz: at least 26 dB
- (ii) On any frequency removed from the carrier frequency by more than 45 kHz, up to the first multiple of the carrier frequency:

at least 60 dB or  $43 + 10 \log (P)$  dB, whichever is the lesser attenuation.

**Method Of Measurement:**Spectrum Analyzer Settings:

RBW: 300 Hz

VBW:  $\geq$  RBW

Span: 100 kHz

Sweep: Auto

Mask: CELLF3E

Input Signal Characteristics (F3E/F3D):

AF1 frequency: 2.5 kHz

AF1 level: 16 dB above the level sufficient to produce  $\pm 6$  kHz deviation with a 1 kHz tone.

SAT: 6000 Hz SAT

SAT level: sufficient to produce  $\pm 2$  kHz deviation.

*EQUIPMENT: Pocket Spider CDPD Modem**FCC ID: MIVCDP06PS**PROJECT NO.: OL0278RUS1***NAME OF TEST: Occupied Bandwidth (WBD & SAT)      PARA. NO.: 2.1049**

**Minimum Standard:** 22.917(d) The mean power of any emission removed from the carrier frequency by a displacement frequency ( $f_d$  in kHz) must be attenuated below the mean power of the unmodulated carrier (P) as follows:

(1) On any frequency removed from the carrier frequency by more than 20 kHz but not more than 45 kHz:

at least 26 dB

(2) On any frequency removed from the carrier frequency by more than 45 kHz but not more than 90 kHz:

at least 45 dB

(3) On any frequency removed from the carrier frequency by more than 90 kHz, up to the first multiple of the carrier frequency:

at least 60 dB or  $43 + 10 \log (P)$  dB, whichever is the lesser attenuation.

**Method Of Measurement:**Spectrum Analyzer Settings:

RBW: 300 Hz

VBW:  $\geq$  RBW

Span: 200 kHz

Sweep: Auto

Mask: CELF1D

Input Signal Characteristics:

RF level: Maximum recommended by manufacturer

10 kbps WBD + DAT

ST

**KTL Dallas**

FCC PART 22, SUBPART H  
800 MHz CELLULAR SUBSCRIBER  
UNITS

*EQUIPMENT: Pocket Spider CDPD Modem*

*FCC ID: MIVCDP06PS*

PROJECT NO.: **0L0278RUS1**

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

**Minimum Standard:** Para. No. 22.917(b). The mean power of emissions must be attenuated below the mean power of the unmodulated carrier on any frequency twice or more than twice the fundamental emission by at least  $43 + 10 \log P$ . This is equivalent to -13 dBm absolute power.

**Method Of Measurement:**

Spectrum Analyzer Settings:

RBW: 30 kHz (AMPS). As required for digital modulations.

VBW:  $\geq$  RBW

Start Frequency: 0 MHz

Stop Frequency: 10 GHz

Sweep: Auto

**EQUIPMENT:** *Pocket Spider CDPD Modem***FCC ID:** *MIVCDP06PS***PROJECT NO.:** *0L0278RUS1***NAME OF TEST: Field Strength of Spurious Radiation**      **PARA. NO.: 2.1053**

**Minimum Standard:** Para. No. 22.917(b). The mean power of emissions must be attenuated below the mean power of the unmodulated carrier on any frequency twice or more than twice the fundamental emission by at least  $43 + 10 \log P$ . This is equivalent to -13 dBm absolute power.

**Calculation Of Field Strength Limit:**

An example of attenuation requirement of  $43 + 10 \log P$  is equivalent to -13 dBm ( $5 \times 10^{-5}$  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  $\leq 1$  GHz:

$G = 1.64$  (Dipole Gain)

$P = 10^{-5}$  Watts (Maximum spurious output power)

$R = 3m$  (Measurement Distance)

$$E = \frac{\sqrt{30GP}}{R}$$

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

For emissions  $> 1$  GHz:

$G = 1$  (Isotropic Gain)

$P = 1 \times 10^{-5}$  Watts (Maximum spurious output power)

$R = 3m$  (Measurement Distance)

$$E = 84.4 - 20 \log \sqrt{1.64} = 82.3 \text{ dBmV/m} @ 3m$$

***The spectrum is searched to 10 GHz.***

**NAME OF TEST: Frequency Stability****PARA. NO.: 2.1055**

**Minimum Standard:** Para. No. 22.355. The transmitter carrier frequency shall remain within the tolerances given in Table C-1.

<b>Freq. Range (MHz)</b>	<b>Mobile &gt; 3 W</b>	<b>Mobile £ 3 W</b>
821 to 896	2.5	2.5

Table C-1

**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.

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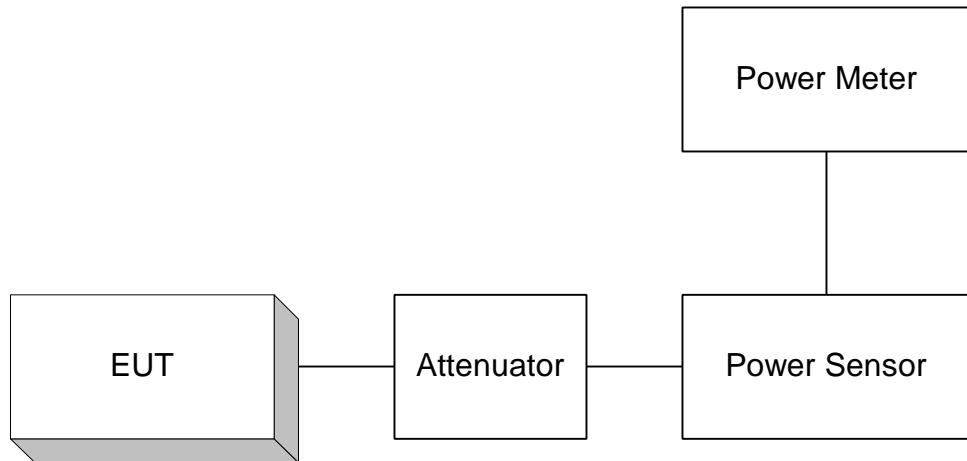
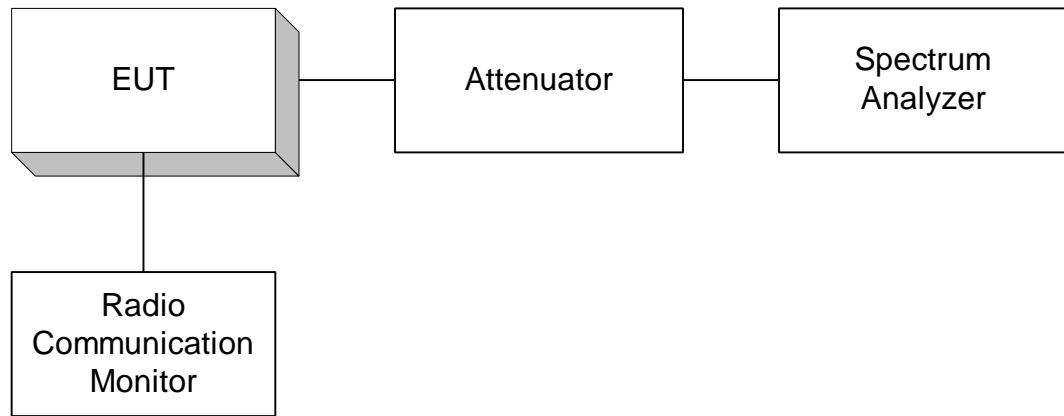
*EQUIPMENT: Pocket Spider CDPD Modem*

*FCC ID: MIVCDP06PS*

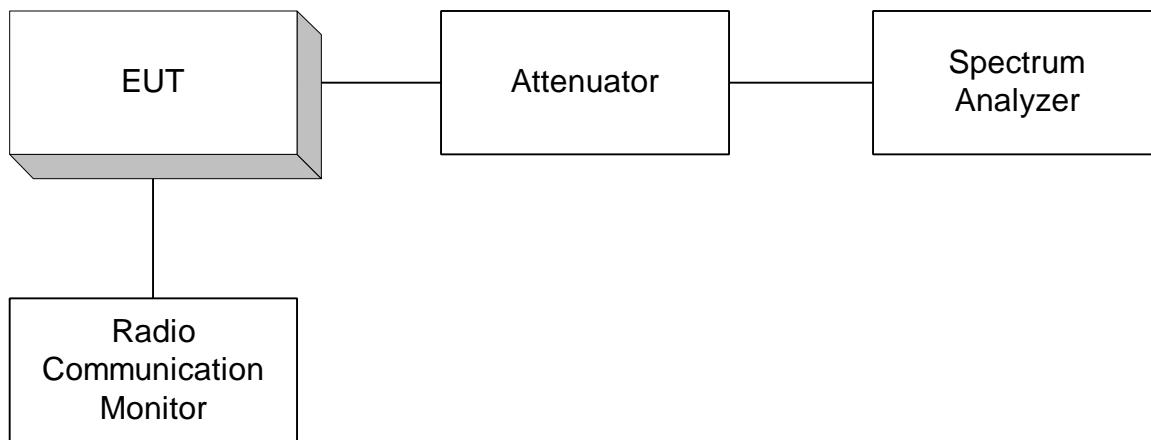
PROJECT NO.: **0L0278RUS1**

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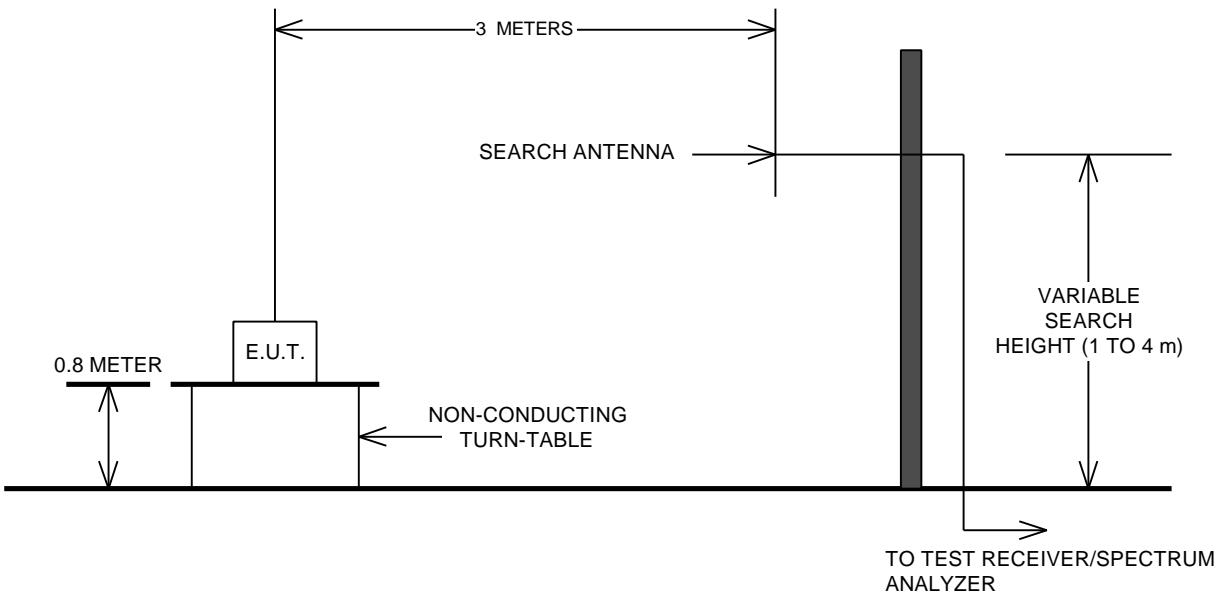
**ANNEX B - TEST DIAGRAMS**

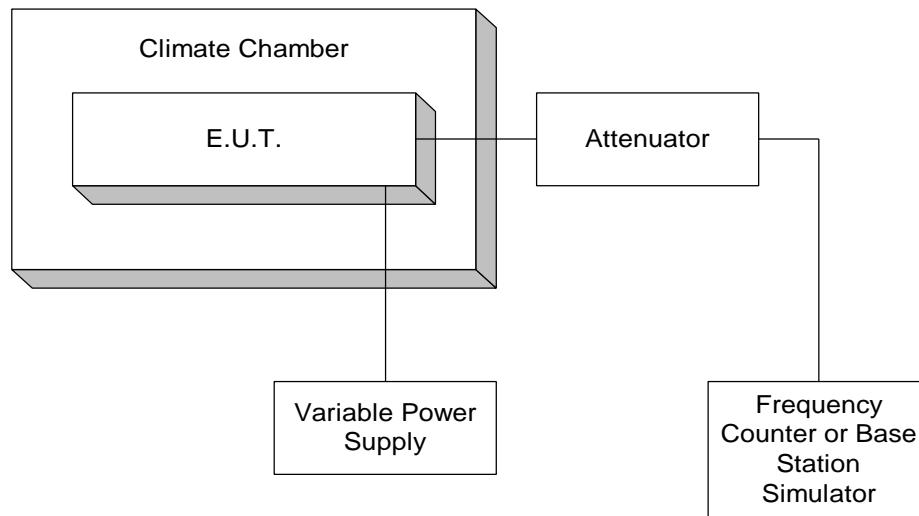
*EQUIPMENT: Pocket Spider CDPD Modem**FCC ID: MIVCDP06PS**PROJECT NO.: 0L0278RUS1***Para. No. 2.1046 - R.F. Power Output****Para. No. 2.1049 - Occupied Bandwidth**

*The Radio Communication Monitor is used only to provide modulation input for external modulation.*

EQUIPMENT: *Pocket Spider CDPD Modem*FCC ID: *MIVCDP06PS*PROJECT NO.: *0L0278RUS1***Para. No. 2.1051 Spurious Emissions at Antenna Terminals**

*The Radio Communication Monitor is used only to provide modulation input for external modulation.*

**Para. No. 2.1053 - Field Strength of Spurious Radiation**

**EQUIPMENT: *Pocket Spider CDPD Modem*****FCC ID: *MIVCDP06PS*****PROJECT NO.: *0L0278RUS1*****Para. No. 2.1055 - Frequency Stability****Para. No. 2.1045 – Audio Frequency Response, Audio Low Pass Filter Response And Modulation Limiting**