from the ground, and separated horizontally by approximately 12 feet, with the antennas oriented downwards again. Figure 4.3-53 shows the plot points taken in the propagation tests, and Figure 4.3-54 detail coverage of the Omnipoint system at the same location.

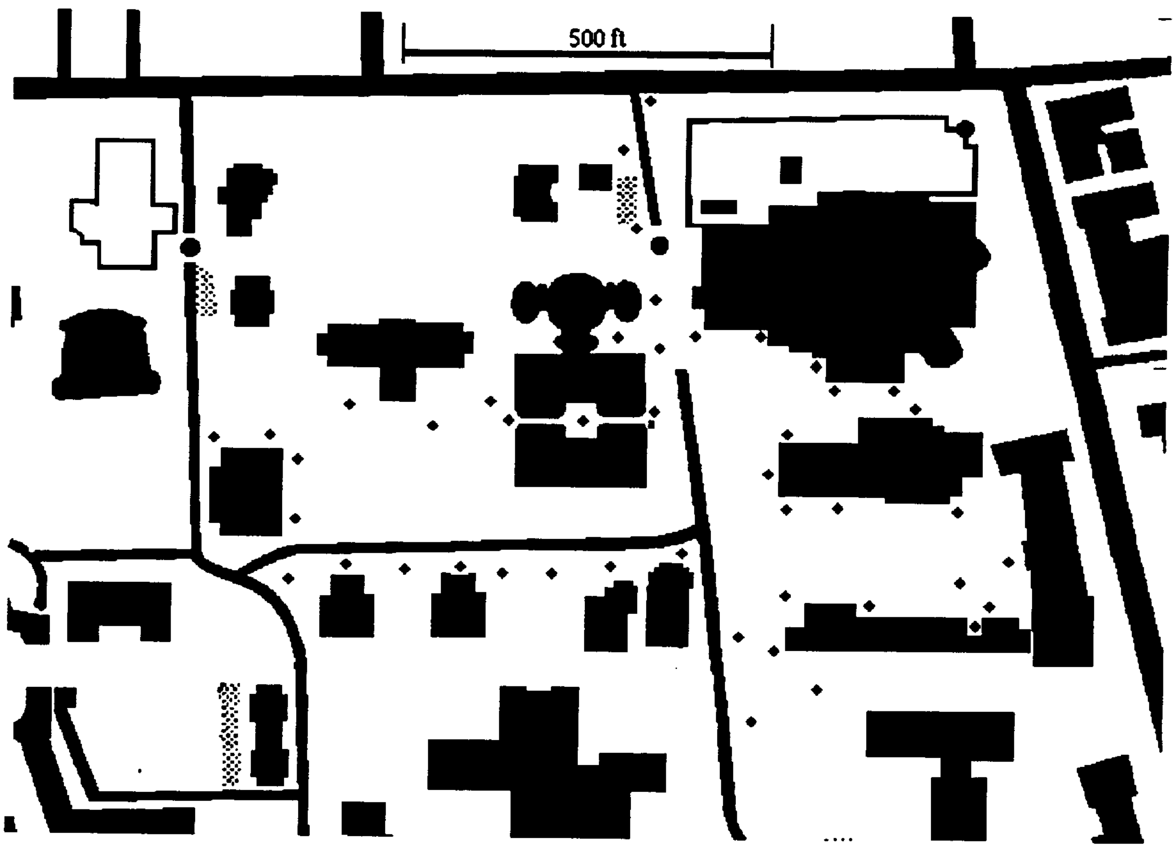
It can be seen that coverage extends to approximately 500 feet where the site is open in a semicircular pattern, accounted for in the placement of the antennas on the East side of the building.

4.3.2.2 - Omnipoint Facility

The Omnipoint facility is situated next to an open field which is ideal for testing of propagation characteristics. In this case, the base station was placed in the Omnipoint conference room at the same location as the indoor tests. This allowed for simulation of a private system in a commercial/office environment requiring both indoor and outdoor coverage, such as an automobile lot.

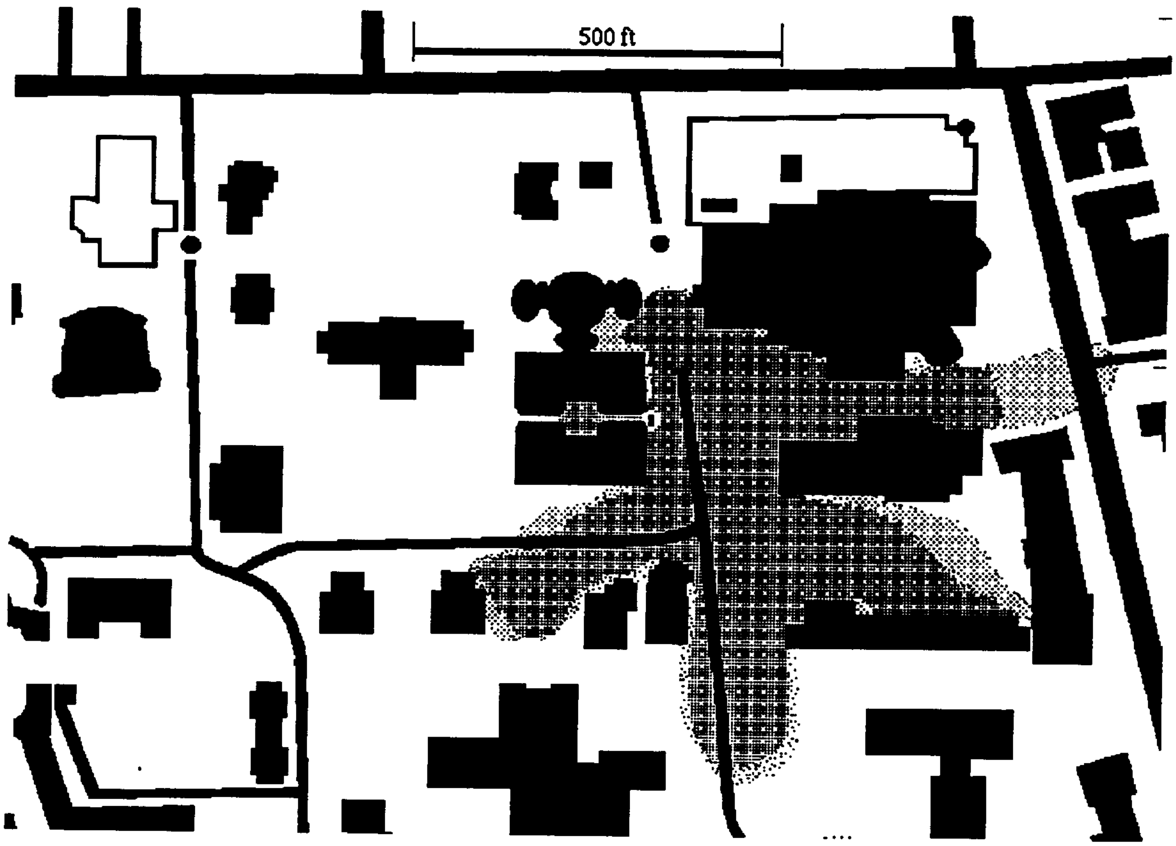
Figure 4.3-55 & 4.3-56 shows plot points taken in the propagation test as well as coverage for the phone system for GOS levels 1 & 2 at 900MHz and 1.8GHz. Figures 4.3-57 & 4.3-58 show the raw data points as well as the results of our least squares regression analysis for each site. RMS propagation coefficient and standard deviation is also indicated on each figure.

Omnipoint CORPORATION

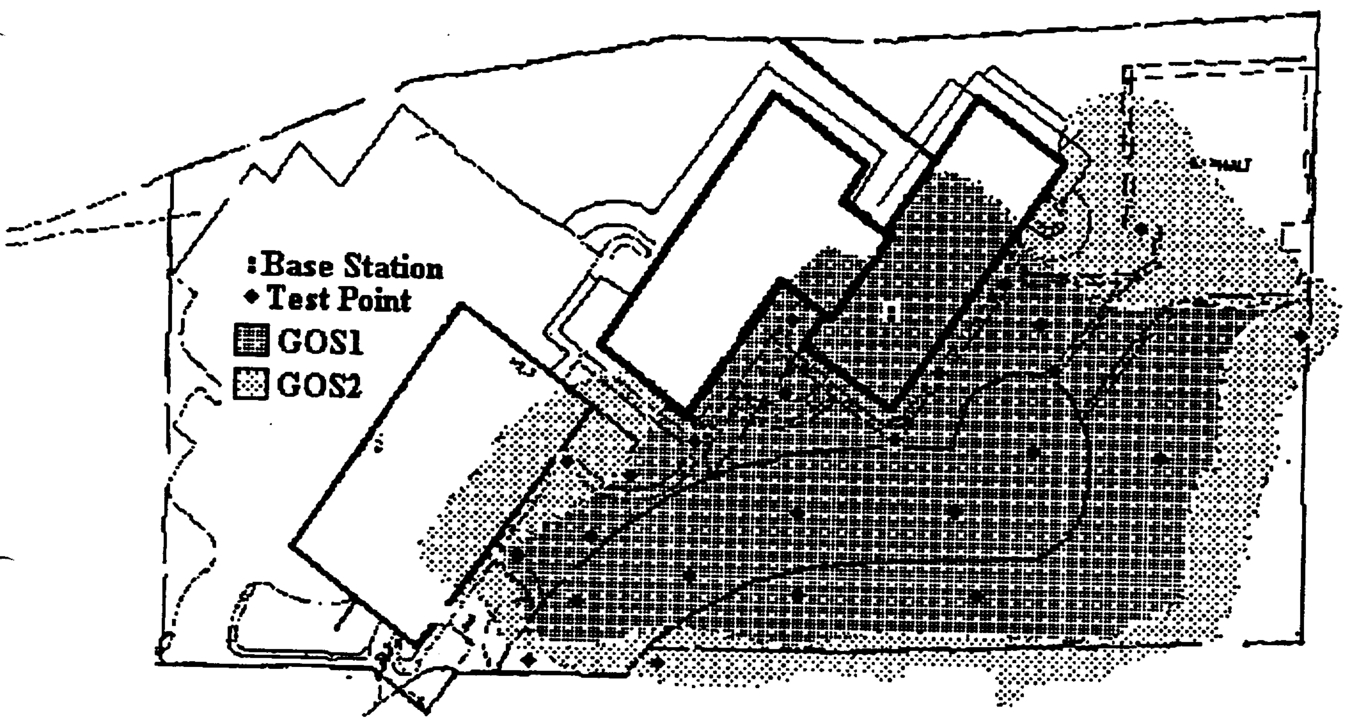


Campus Site No. 2
Test Points
Figure 4.3-53

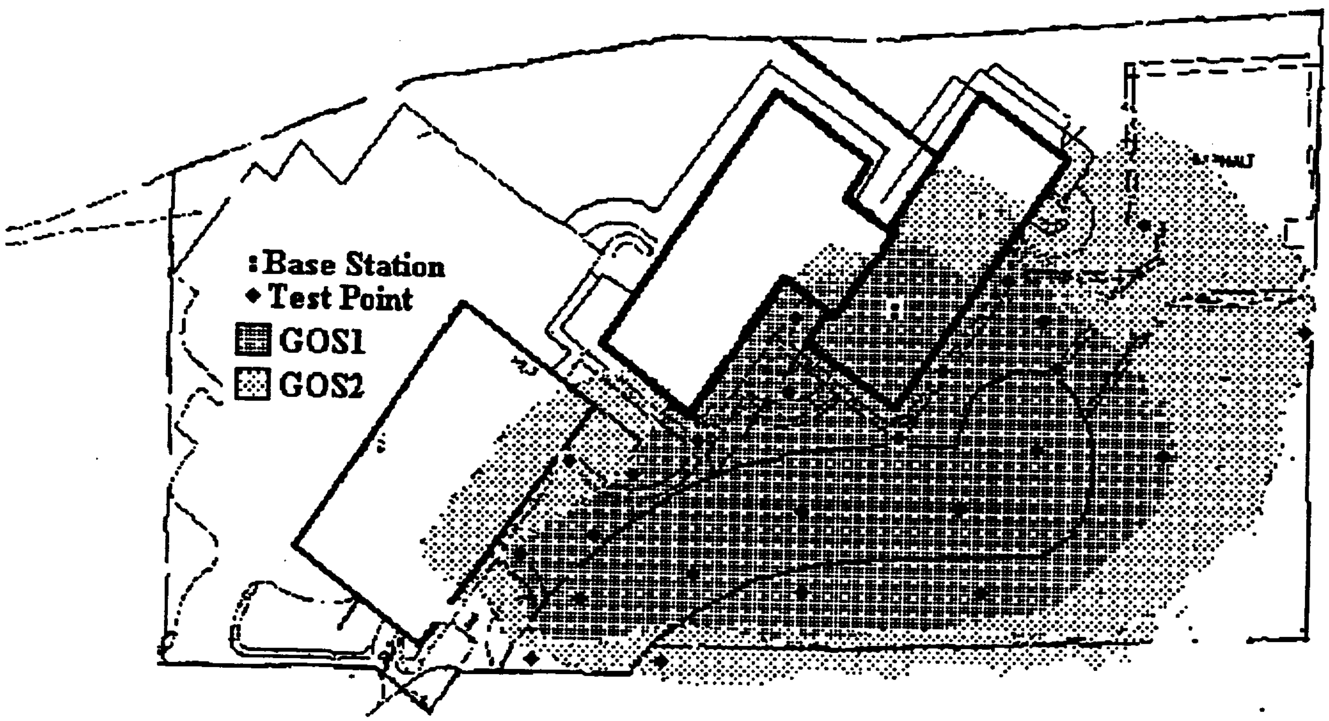
Omnipoint
CORPORATION



Campus Site No. 2
Coverage Plot
Figure 4.3-54



900MHz Outside Coverage
Omnipoint Facility
Figure 4.3-55



1800MHz Outside Coverage
Omnipoint Facility
Figure 4.3-56

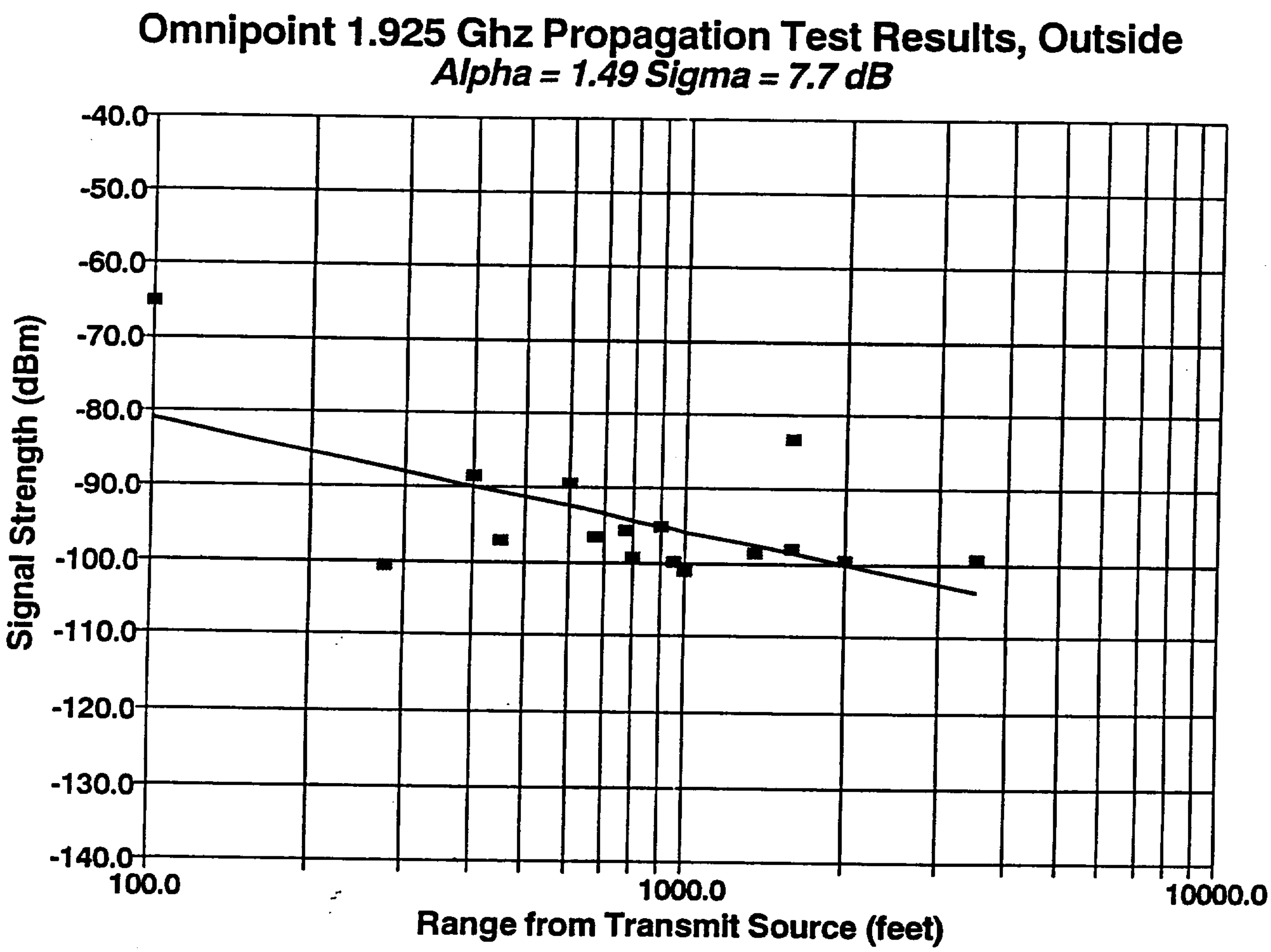

Omnipoint 1.925 Ghz Propagation Test Results, Outside
Alpha = 1.49 Sigma = 7.7 dB
Signal Strength (dBm)
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
-120.0
-130.0
-140.0
100.0
1000.0
10000.0
Range from Transmit Source (feet)

Figure 4.3-57

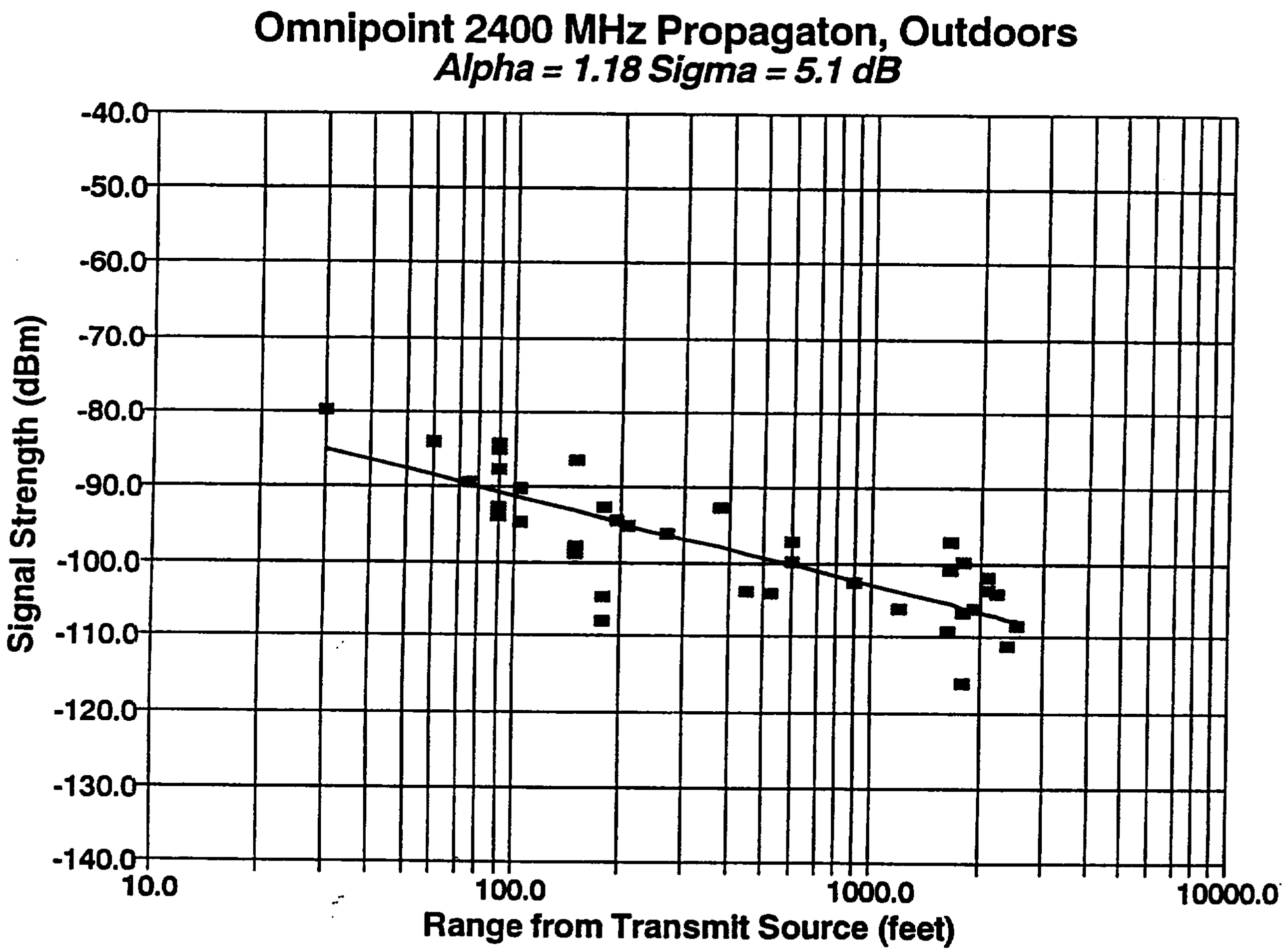

Omnipoint 2400 MHz Propagaton, Outdoors
Alpha = 1.18 Sigma = 5.1 dB
Signal Strength (dBm)
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
-120.0
-130.0
-140.0
10.0
100.0
1000.0
10000.0
Range from Transmit Source (feet)

Figure 4.3-58

5 Continuing Work

Efforts in the 900 and 2400 MHz ISM bands will closely parallel each other in an effort to compare operations between the two bands. In selected cases, studies will also include testing in the 1.9 GHz OFS band.

5.1 902 - 928 MHz

5.1.1 Application Tests

Testing to date has concentrated on relatively few users in a well defined area. Increased numbers of base stations and handsets will allow for more operations oriented testing. Planned wide area deployments will provide mare data on "end user" perceptions of the equipment. At the same time, we are planning to begin software improvements that facilitate operations in a networked, mobile environment. Provisions for performing hand-offs between base stations and the associated switch protocols will be incorporated.

5.1.2 Bandwidth Tests

As direct sequence spreading bandwidth is increased, the effects of frequency selective multipath induced fading are reduced. Although some portions of the signal will be faded out, significant portions will not be faded. In essence, the wider bandwidth waveform employs frequency diversity to overcome the effects of fading.

As delay spread increases, fading becomes increasingly frequency selective and a narrower bandwidth waveform will provide the same level of frequency diversity. Delay spread is strongly dependent on the specifics of the propagation environment (e.g., indoors vs. outdoors/type of building). Tests employing different spreading bandwidths will be conducted to establish the point of diminishing returns in various environments.

5.1.3 Propagation Tests

Planned efforts over the next few months will concentrate on developing quantitative comparisons between wideband and narrowband propagation characteristics. By measuring the output amplitude of the spread spectrum correlation process, we will obtain better estimates of the effects of selective fading on our specific signal structure. At the same time, using the same antenna and locations, we will measure narrowband propagation characteristics to obtain a direct, one to one comparison between the two propagation modes.

We intend to quantify the following channel characteristics for both modes:

- Delay spread/coherence bandwidth
- Mean propagation coefficient
- Standard deviation away from regression estimates
- Compare results with standard models (e.g., Hata) and other researchers.

5.2 2400 - 2483.5 MHz

To date, the bulk of our efforts have been in the 902-928 MHz band. Obtaining one to one comparisons with 2400 MHz propagation will further our understanding of requirements for operation in the ISM bands.

5.2.1 Application Tests

Equipment in these bands is at an earlier stage of development. Following a path similar to what we have done in the 902 - 928 MHz band, testing will concentrate on engineering studies oriented towards developing high performance, low cost handsets and base stations. Ongoing research into the characteristics and usage patterns in this band will be continued.

5.2.2 Bandwidth Tests

Testing will be identical to that at 902 to 928 MHz described in Section 5.2.2 using the same locations.

5.2.3 Propagation Tests

Testing will be identical to that at 902 to 928 MHz described in Section 5.2.3 using the same locations.

Appendix 1.

Omnipoint detail on all demo locations:

CALIFORNIA:
- Los Angeles
- Orange County
- San Diego
- San Francisco
- Walnut Creek

COLORADO:
- Colorado Springs
- Boulder

FLORIDA:
- Miami
- Orlando

GEORGIA:
- Atlanta

HAWAII:
- Maui
- Kona

ILLINOIS:
- Hoffman Estates
- Chicago

IOWA:
- Cedar Rapids

LOUISIANA:

New Orleans

MARYLAND:

Baltimore

Silver Springs

MASSACHUSETTS:

Boston

MINNESOTA:

Minneapolis

St. Paul

MISSOURI:

St Louis

NEVADA:

Las Vegas

NEW JERSEY:

Princeton

NEW YORK:

Manhattan

Albany

NORTH CAROLINA:

Charlotte

Charlottesville

PENNSYLVANIA:

Philadelphia

TEXAS:

Dallas

VIRGINIA:

Arlington

Crystal City

WASHINGTON DC:

Multi-level apartment building
High-rise office building

Omnipoint
CORPORATION

COMMODITIES EXCHANGE
SITE SURVEY REPORT

Table of Contents

Note: This document has been revised to eliminate all information considered to be of a Confidential nature.

Omnipoint
CORPORATION

I. Overview and Environment

Purpose: The site survey of the Commodities Exchange (Exchange) was undertaken as a part of Omnipoint's consulting agreement with CLIENT to study the communications environment of the Exchange with a view toward the possible implementation of a Spread Spectrum Radio Frequency (SSRF) based data network. The proposed data network would be a sub-system integrated into CLIENT's hand held terminal (HHT) devices and Base Station master control units.

Deliverables: Omnipoint provided CLIENT this written report and all supporting documentation associated with the site survey. In addition, Omnipoint provided CLIENT with a reasonable amount of time to answer questions and support the project as required.

Environment: The site survey was conducted on December 10th and 11th at the Exchange facilities situated in the ______________________________. The Exchange is located on the __________________________ with all but the NW Annex housed in a single, large room (see Appendix iii. - Exchange Floor Annotated Map) measuring approximately 200' (N-S) by 210' (E-W) by 24' high in the center of the floor with lower (9'-10') ceilings at the floor perimeter (about 15'). The room is divided into four roughly equal quadrants with windows on three sides containing, respectively, the ______________ Commodities Exchange, the ________________________, the ______________ Exchange and the ________________________. The Exchange NW Annex measures about 35' (N-S) by 20" (E-W) by 15' high and is located in a separate room accessed via the ramp shown in the NW corner of the main floor.

Each area is comprised of several trading "pits", banks of telephone (booths) separated by 3-4' aisles, platforms where the "catchers" receive and report the trades as they occur and overhead clusters of electronic display and public address equipment. The ceiling height would allow for very good antenna placement although, some line-of-sight (LOS) blockage will be inevitable. There is an open steel grid comprised of 8" x 12" tubular steel arranged in 16' squares suspended from the ceiling that may provide for antenna mounting and ground plane facilities.

The only RF transmitter found on the floor was a 47MHz wireless microphone in the ______ quadrant and used only intermittently. A few pagers were evident but cellular and cordless phones are not allowed on the trading floor during the trading day.

With a reported 10,000 telephones, hundreds of other types of electronic devices emitting spurious RF signals across the spectrum, and several hundred people on the trading floor, the Exchange is an extremely busy and often frenetic environment. Everyone on the floor treated us with the utmost courtesy and were very helpful and cooperative.

II. Methodology

Survey Phases: The survey was conducted in five phases:

1. Survey Planning and Preparation.
2. Tour and Inspection of Exchange Facility.
3. SSRF Propagation Survey.
4. Interference Survey.
5. Analysis and Reporting of Survey.

Part 1. included several discussions with CLIENT and Exchange personnel to determine survey logistics and possible problems, preparation of the survey plan, staging, packaging and transportation of the test equipment and re-staging prior to the test.

Part 2. involved brief meetings with CLIENT and Exchange personnel the afternoon of December 10, a walking tour of the facility and a final session to confirm the test plan.

Part 3. of the survey was designed to conduct a series of propagation tests throughout the Exchange. This phase was conducted after trading hours on December 10th and consisted of the initial equipment calibration including the baseline measurement of the center of the main trading floor with no known SSRF radio activity, a measurement from the same spot with a co-located Omnipoint 4-User Wireless Phone as the SSRF transmitter source transmitting at 100mW output power in the 902-928MHz band and a quick walk around the trading floor using a wireless telephone handset to determine the general area of coverage.

This initial setup was followed by the measurement and plotting of spectral content in the 902-928MHz band at 26 locations throughout the trading area and one measurement of the intermediate frequency (IF) used by Omnipoint equipment. Each measurement was taken using the sample-and-hold function of the Spectrum Analyzer for at least 20 seconds to yield peak spectral outlines of the received signals and then plotted (see Appendix i. - Table #1A). For this phase of the test, an antenna was raised in the center of the main floor on an electrically-isolated boom to a height of about 20' to as closely as possible approximate the likely positioning of an antenna in an actual operation. The measured losses will naturally be greater when the floor is occupied and assumptions about the relative signal attenuation will be included in the system design (see "Conclusions").

Part 4. of the survey began the next morning, December 11th, with a suite of spectral energy measurements at 17 locations on the trading floor during active trading and with no known SSRF equipment in operation to determine interference levels at various bands of the frequency spectrum. Fifteen of the test sets included measurements at 120MHz, 915MHz, 1900MHz and 2440MHz, respectively, an Omnipoint IF frequency, two of the ISM bands currently authorized or being contemplated by the FCC for probable SSRF unlicensed use (902-928MHz and 2400-2485MHz) and band being sought by several telephone companies for unlicensed wireless phones. Two other test locations, annotated as "special", were included due to an unusual level and type of interference detected there.

Part 5. included the logging and analysis by Omnipoint engineering staff of the captured data and preparation of this report.

Test Equipment: The test setup used (see Drawings #1 & #2 in Appendix i.) included a 1/4 wave 0dB gain monopole antenna situated at a "belt height" of 3 1/2' connected via a 4 foot RG-58 coaxial cable to the input of an RCD & Associates Model A-1000 33dB gain pre-amplifier. The pre-amplifier was then connected by another 4-foot RG-58 coaxial cable to an Advantest R4131B Spectrum Analyzer. The output of the Analyzer was connected to a Hewlett-Packard 4770A Pen Plotter via an HP-IB bus connector. The entire system was mounted on a luggage cart for portability and powered by a DC-to-AC converter connected to an automobile battery.

The Propagation Tests were conducted using a standard Omnipoint Wireless 4 Channel Telephone Base Station transmitting in the 902-928MHz range on a single 1/4 wave, 0dB gain monopole antenna as the source transmitter. The output antenna used was a 1/4 wave monopole mounted on an electrically isolated boom and placed at a height of approximately 20' above the center of the trading floor connected to the source via a 20 foot section of RG-58 coaxial cable. The SSRF source was stationary and powered by 110VAC supplied at a booth.

III. Test Results:

Table 1

Propagation Test Results

Area	Range (feet)	PAve (dBm)	Loss (dB)	Peak (dBm)	Null (dBm)	Fade (dB)
1	15	-41.8	58.8	-29.8	-46.8	12.0
2	15	-46.8	63.8	-34.8	-59.8	13.0
3	30	-49.8	66.8	-36.8	-55.8	6.0
4	85	-57.8	74.8	-47.8	-61.8	4.0
5	55	-51.8	68.8	-39.8	-56.8	5.0
6	40	-46.8	63.8	-39.8	-57.8	11.0
7	80	-56.8	73.8	-44.8	-61.8	5.0
8	50	-46.8	63.8	-37.8	-51.8	5.0
9	60	-56.8	73.8	-38.8	-63.8	7.0
10	75	-56.8	73.8	-46.8	-61.8	5.0
11	42	-46.8	63.8	-33.8	-54.8	8.0
12	63	-46.8	63.8	-36.8	-61.8	5.0
13	80	-61.8	78.8	-47.8	-76.8	15.0
14	55	-58.8	75.8	-50.8	-67.8	9.0
15	113	-61.8	78.8	-46.8	-75.8	14.0
16	70	-51.8	68.8	-40.8	-62.8	11.0
17	93	-61.8	78.8	-49.8	-74.8	13.0
18	40	-48.8	65.8	-38.8	-59.8	11.0
19	100	-59.8	76.8	-50.8	-71.8	12.0
20	80	-58.8	75.8	-45.8	-68.8	10.0
21	95	-63.8	80.8	-50.8	-70.8	7.0
22	140	-87.8	104.8	-75.8	-94.8	7.0
23	130	-81.8	98.8	-75.8	-94.8	13.0
24	106	-54.8	71.8	-46.8	-61.8	7.0
25	36	-56.8	73.8	-40.8	-59.8	3.0
26	90	-51.8	68.8	-38.8	-56.8	5.0

Table 1 column definitions:

Area — Number of test position (ref. Appendix iv. Exchange Floor Annotated Map).

Range — Distance from transmit position to test position.

PAve — Average power of measured signal, taken by estimating the average received signal strength over center frequency ±5MHz.

Loss — Path loss (signal attenuation).

Peak — Peak power (center frequency ±5MHz).

Null — Lowest power null (center frequency ±5MHz).

Fade — Worst case frequency selective multipath fade. Measurement is taken as difference between PAve and Null.

Data formula derivations:

Transmit:

$$P_{ERP} = P_{Out} - Loss_{Cable_{20'}} + Gain_{Ant}$$

Where

P_{ERP} = Effective Radiated Power

P_{Out} = Power out of Base Station

$Loss_{Cable_{x'}}$ = Signal attenuation through RG-58 cable @ x feet

$Gain_{Ant}$ = Antenna gain/loss

Therefore

$P_{ERP} = +20dBm - 3dB - 0dB$

$P_{ERP} = +17dBm$

Receive:

$P_{Rx} = P_{Measured} + Gain_{Ant} + Loss_{Cable_{4'}} - Gain_{PreAmp} + Loss_{Cable_{4'}}$

$P_{Rx} = P_{Measured} + Gain_{Ant} + 2(Loss_{Cable_{4'}}) - Gain_{PreAmp}$

Where

P_{Rx} = Adjusted (True) RF power received at antenna

$P_{Measured}$ = Measured RF power at spectrum analyzer input (Raw data)

$Gain_{Ant}$ = Antenna gain/loss

$Loss_{Cable_{x'}}$ = Signal attenuation through RG-58 cable @ x feet

$Gain_{PreAmp}$ = Gain of Preamplifier

Therefore

$P_{Rx} = P_{Measured} + 0dB + 2(0.6)dB - 33dB$

$P_{Rx} = P_{Measured} - 31.8dB$

Attenuation $= P_{TX} - P_{RX} = P_{TX} - P_{Measured} + 31.8dB$

IV. Test Results:

Propagation Results Analysis

Signal Strength -

Received signal levels on the main trading floor vary little between quadrants, where average levels are -49.8dBm (SW Quadrant) to -57.6dBm (NW Quadrant), with worst case signal levels from -61.8dBm to -63.8dBm. The quadrants with the worst average received signal levels are the ______________________ Exchanges, which also have the most obstructions to the signal path (through large display panels and CRTs).

Signal levels on the NW Annex floor were attenuated to -81.8dBm and -87.8dBm; not surprising due to the distance from the transmitter and the solid wall structures in the path.

Graph #1 displays attenuation levels versus distance from the transmitter. It is seen that, as expected, signal levels decrease as a function of distance, but do not vary wildly over the 15' to 110' distances covered on the main trading.

Multipath -

The multipath effects on received signals were determined by measuring the level of the worst notch in the received signal ($f_c \pm 5$MHz) and comparing it to the averaged sinx/x spectrum. Using this criteria, worst case fades were observed to be on the order of 13 to 15dB, with average fades ranging from 7dB in the __________ sector, to 11.6 at the __________ Exchange. The differences between best and worst case again are reflective of the number of obstructions in each sector, where ________ is wide open, while _______ is relatively densely congested with display panels and CRTs. Graph #2 shows that multipath effects are not necessarily a function of distance in this environment, with small and large fades being experienced at both short and long ranges.

Interference Test Results

The receive test fixture described above was positioned at 17 sites around the trading floor during a full trading session, including the opening and closing (see Appendix iii. Spectrum Analyzer Plots of Interference Measurements). The timing of the survey was planned such that all exchanges were open and fully operational during most of the testing period so that worst case interference generation could be encountered (it was assumed that most of the potential interference would come from equipment operating during trading hours). This task was performed to determine spurious interference levels of equipment (as non-intentional emitters) on the trading floor as well as both intentional and non-intentional emissions from sources outside the trading facility. At each position, sample and hold measurements over a period of about 60 seconds were taken with different bandwidths (depending on the band under test), yielding a spectral plot of noise and interference levels in each band. Table #2 displays worst case interference in each band at each location.

Table 2

Worst Case Interference at Each Site Tested

Location	100-140MHz (dBm)	905-925MHz (dBm)	1.80-1.99GHz (dBm)	2.4-2.485GHz (dBm)
A	-63.8	-75.8	-72.8	-96.8
B	-79.8	-87.8	-101.8	-101.8
C	-53.8	-66.8	-56.8	-61.8
D	-61.8	-75.8	-92.8	-101.8
E	-71.8	-81.8	-101.8	-101.8
F	-54.8	-68.8	-71.8	-76.8
G	-59.8	-77.8	-101.8	-101.8
H	-61.8	-74.8	na	na
I	-68.8	na	na	na
J	-60.8	-77.8	-96.8	-101.8
K	-58.8	-84.8	-101.8	-101.8
L	-61.8	na	na	na
M	-80.8	-85.8	-101.8	-101.8
N	-64.8	-70.8	-87.8	-101.8
O	-53.8	-66.8	-67.8	-81.8
P	-71.8	-81.8	-101.8	-72.8
Q	-64.8	-96.8	-101.8	-101.8

Interference Results Analysis

120MHz Band (IF) -

Interference encountered in this band appears to be of two types: intentional and non-intentional emitters. The non-intentional emissions appear strongest at the sites in the interior of the trading floor and probably come from the various CRT's and display boards, as typified in the Plots of Areas B, H, and N. Interference of the intentional emitter type is characterized as a more discrete emission, and likely caused by handheld portable radios of some sort which are located external to the building as they are most prominent near the windows. Plots A, C and F are typical frequency plots of this type of interference. Regardless of the type of interference encountered on the floor of the exchanges (intentional or non-intentional radiation) the worst case power level detected was roughly -53.8dBm and was typically much lower which should not cause a problem for the IF circuitry of the Omnipoint system as signal to noise levels, radio shielding and jamming margin should provide very robust operation.

900MHz ISM Band -

In all the data taken at 915MHz there exists a strong signal centered at about 933MHz, which is out of the ISM band (902-928MHz). This frequency is allocated to national mobile paging networks and is consistent at all sites in the U.S. where Omnipoint has done site surveys. This signal can potentially cause interference problems with poorly designed 900MHz spread spectrum systems as it can overload the front end of a receiver and cause in-band intermodulation products. The filtering and interference immunity that the Omnipoint system has designed into it are sufficient to reject any potential interfering characteristics that this paging system might present. In fact, Omnipoint has several systems operating across the nation in the presence of this signal at even higher power levels without the performance of the Omnipoint system being hindered in any way.

Other interference in the band appear to be discrete narrowband emissions (Area plots A, C, F, and G). While it is unclear what the sources of these signals are, it is assumed that they are external to the building since they are encountered mostly at positions near the windows.

There also appear to be spurious signals being generated by equipment on the trading floor, Plots D, N and P, but these are highly intermittent in nature. Plot N in particular shows a disturbing series of spurious signals generated by CRT's and display boards. This plot was taken with the test fixture located between and under a bank of equipment near the ___________ pit. It is unknown what the particular source of this interference might be. Two plots were taken at this site, and the sample and hold function was left for approximately 3 minutes each time. The plots are consistent with each other, showing a fairly high level of emissions in the band.

As with the 120MHz IF band, the Omnipoint system should have no problem functioning in this band. The Omnipoint system has been designed to perform in the presence of a high level of interference and even with negative signal-to-interference ratios (S/I). Comparison of the propagation and interference results indicates a healthy signal-to-interference ratio (See Table #3) which will allow the Omnipoint system to function with an even greater margin. When many traders occupy the floor, this margin will be needed as body absorption of the signal could be on the order of 10 to 20 dB. The only point on the trading floor where there is not a minimum 10dB S/I ratio is on the NW Annex floor, which shows -6dB S/I at one location. Even at this point the Omnipoint system should still perform well.

Table 3

Signal to Noise Comparisons @ 902 - 928MHz

Site (Int)	(Prop)	Interference (dBm)	Signal (dBm)	S/I (dB)
A	4	-75.8	-57.8	18.0
B	3	-87.8	-49.8	38.0
C	7	-66.8	.56.8	10.0
D	1	-75.8	-41.8	34.0
E	8	-81.8	-46.8	35.0
F	10	-68.8	-56.8	12.0
G	13	-77.8	-61.8	16.0
H	1	-74.8	-41.8	33.0
J	15	-77.8	-61.8	16.0
K	18	-84.8	-48.8	36.0
M	25	-85.8	-56.8	29.0
N	20	-70.8	-58.8	12.0
O	24	-66.8	-54.8	12.0
P	22	-81.8	-87.8	-6.0
Q	23	-96.8	-81.8	15.0

1.80 - 1.85GHz Band -

This band has been allocated by the FCC for point-to-point terrestrial microwave links and are the only known source of intentionally radiated interference which we could account for in the bandwidth. The presence of these signals were most prominent along the West and South sides of the building near the windows. Since these links are highly directional in nature, it is assumed that few exist in the direction of the East side of the building or, more likely, are pointed away from the _________. Within the interior part of the floor, at Site N., equipment belonging to the Exchange appears to be emitting spurious products in the 1.80GHz band as well as the 900MHz band. The interference in this band is at such a low level and of characteristic nature such that it should cause no problems for the Omnipoint system.

2.4GHz ISM Band -

This band appears relatively clean, with the only captured interferers being those encountered at Sites C, F and O which are located along the West and South walls near the windows. It is assumed that these sources are external to the building and it is not known what they are. With the Omnipoint system's inherent ability to reject interference of this nature and with the low levels encountered (See Table #2) there should be no problem operating in this band.

VI. Conclusions

Propagation

Propagation characteristics in this environment will allow complete coverage over the entire main floor of the exchange in the 900MHz band with a single base station. Worst case signal levels of -64dBm allow for approximately 25 to 30dB of link margin where the Omnipoint system performs with receiver sensitivities of -90 to -95 dBm. This amount of margin should be sufficient to allow for body absorption of the signal when the floor is completely occupied. Assuming that propagation characteristics in the 1.8GHz and 2.4GHz bands are similar to 900MHz properties, system performance should be roughly equivalent.

Signal Attenuation

Signal attenuation from the center of the main trading floor to the ________ Exchange will likely necessitate a dedicated base station and/or antenna for this floor. This will be determined in the further study phase of the current agreement.

Interference

Interference from both non-intentional radiators on the trading floor and transmitters external to the building don't present a problem for a correctly designed spread spectrum system with a significant degree of jamming margin (interference rejection). The Omnipoint system with 10dB of jamming margin will be able to function flawlessly in this application, regardless of which band is chosen for implementation.

Appendix i. - Supporting Information

Table #1A.

Index of Spectrum Analyzer Propagation Measurements

Area #	/(Ref.)	Location	Notes
1.	(D.)	Center of main floor	Baseline spectrum calibration
2.		_______ Options pit	CRT bank blocks antenna LOS
3.	(B.)	_______ Options pit	CRT banks block LOS
4.	(A.)	Booth behind ______ pit	Booth and pillar block LOS
5.		________ Futures pit	Clear LOS, CRTs 3-4' from antenna
6.		_________ Futures pit	Clear LOS, CRT 3' from antenna Second measurement at IF.
7.	(C.)	Booth in SW corner.	By windows, LOS blocked.
8.	(E.)	Booth by ________ pit.	Clear LOS.
9.		____________ pit.	Clear LOS.
10.	(F.)	Inquiry terminals area.	Clear LOS.
11.		____________ pit.	Clear LOS.
12.		_____________ pit.	LOS blocked.
13.	(G.)	Inquiry terminals area.	Near windows, clear LOS.
14.		_________ pit.	LOS blocked by CRT bank.
15.	(J.)	Information Center.	Near windows, clear LOS.
16.		_________ pit.	LOS blocked by several CRT banks.
17.		Booth in N-central area.	Clear LOS.
18.	(K.)	________ Options pit.	LOS blocked by CRTs, heavy interference.
19.		Booth in NW corner.	Clear LOS.
20.		________ pit.	Clear LOS, heavy interference.
21.		Booth.	Clear LOS.
22.	(N.)	_________ pit.	LOS blocked, signal very attenuated.
23.	(Q.)	Booth in NE ______ area.	LOS blocked, -15dB multipath fade.
24.	(O.)	Booth in W-central area.	Near windows, clear LOS.
25.		Booth.	Clear LOS.
26.		Aisle near N-exit.	Clear LOS.

Table #2A.

Index of Spectrum Analyzer Interference Measurements

Area #	/(Ref.)	Tests	Location	Notes
A.	(4.)	All	Booth in SW corner.	Near windows.
B.	(3.)	All	_______ Options pit.	Very active trading, very little EMI.
C.	(7.)	All	Booth in SW corner.	Near windows, heavy microwave EMI.
D.	(1.)	All	Center of main aisle.	Between CRT banks.
E.	(8.)	All	_______________ pit.	Very busy, close to windows.
F.	(10.)	All	Booth in SE corner.	Near windows, very busy on floor.
G.	(13.)	All	Booth in E-central area.	Near windows, little EMI vs. other areas.
H.	(1.)	Note	_____________ options.	Under CRT bank, 915 & 120MHz only.
I.	(na)	Note	Center of main aisle.	Special, 120MHz only, spike at 160MHz.
J.	(15.)	All	NE Information Center.	Near windows.
K.	(18.)	All	______ options pit.	Between CRT banks.
L.	(1.)	Note	Center or main aisle.	Special, 120MHz only, spike at 160MHz.
M.	(na)	All	_____ pit.	Quiet.
N.	(22.)	All	______ options pit.	Heavy EMI across 915MHz band.
O.	(24.)	All	Booth in w-central area.	Near windows, heavy EMI, quiet day.
P.	(22.)	All	______ pit.	EMI spikes at 920 and 2400MHz.
Q.	(23.)	All	______ options pit.	EMI spike at 120MHz.