CONTRACT

31283

THIS CONTRACT is made and entered, in duplicate, as of August 19, 2009 for reference purposes only, by and between FOCUS COMMUNICATIONS, INC. DBA VISLINK SERVICES, a California corporation, with a place of business at 526 West Blueridge Avenue, Orange, California 92865 ("Contractor"), and the CITY OF LONG BEACH, a municipal corporation ("City").

WHEREAS, Section 2.84.010 of the Long Beach Municipal Code authorizes the Purchasing Agent to enter contracts or purchase orders for purchases relating to homeland security when such purchases are funded with grant funds; and

WHEREAS, the City desires to enter into a contract for the purchase, delivery and installation of a Regional Public Safety Microwave Network to facilitate cooperation and collaboration between agencies, especially during training exercises and large-scale incidents, from Contractor using such grant funds;

NOW, THEREFORE, in consideration of the mutual covenants hereinafter contained, the parties agree as follows:

1. Contractor shall sell, deliver, and install to the City a Regional Public Safety Microwave Network as authorized by L.B.M.C. Section 2.84.010, and more fully described in Exhibit "A", attached hereto and incorporated herein by reference, for a total sum not to exceed Four Hundred Ninety-Nine Thousand One Hundred Dollars ($499,100.00), with the option of adding expenditures up to ten percent (or $49,910), if necessary and if funds are available.

2. City shall pay Contractor in due course of payments for the Regional Public Safety Microwave Network.

3. The term of this Contract shall commence at midnight on August 19, 2009 and shall terminate at 11:59 p.m. on August 18, 2010 or whenever the warranty on the Regional Public Safety Microwave Network expires, whichever is later.

4. Contractor warrants the Regional Public Safety Microwave Network

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ROBERT E. SHANNON, City Attorney
333 West Ocean Boulevard, 11th Floor
Long Beach, CA 90802-4664

against defects for a period of one (1) year following delivery to and acceptance by the City and Contractor shall repair or replace the Regional Public Safety Microwave Network should it become defective during the warranty period.

5. If Contractor delivers to City any equipment, article, method, formula or process of which the whole, or any part thereof, is covered by letters patent, Contractor shall either be the owner of the letters patent covering the same or be a licensee or grantee of such patent so as to entitle City to Purchase, acquire and use said equipment, article, appliance, method, formula or process. Contractor shall indemnify, defend, and hold City harmless from and against any and all liability, claim, demand, damages, causes of action, cost or expenses (including reasonable attorney's fees) in connection with any infringement or allege infringement of any letters patent, or patent rights of any nature, with respect to any equipment, article, appliance, method, formula or process delivered to City pursuant to this Contract or resulting from the use thereof by City. If the City is legally prevented from the use of any equipment, article, appliance, method, formula or process covered by or alleged to be covered by letters patent, the indemnification heretofore provided for shall include, at the option of City, the removal of said equipment, article, or appliance, and Contractor shall furnish City with substitute equipment, article, appliance, method, formula or process complying fully with the terms of this Contract. The substitution of any equipment, article, appliance, method, formula or process by Contractor shall not terminate the indemnification provisions of this Contract, but said provisions shall remain in effect so long as City retains and uses said equipment,

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California 90802. Notice shall be deemed given on the date personal delivery is made or on the date of deposit in the mail, whichever first occurs.

IN WITNESS WHEREOF, the parties have caused this document to be duly executed with all formalities required by law as of the date first stated above.

FOCUS COMMUNICATIONS, INC. DBA VISLINK SERVICES, a California corporation

August 25, 2009

By _____
President

Robert Jordan
Type or Print Name

August 25, 2009

By _____
Secretary

Thomas Vega
Type or Print Name

"Contractor"

CITY OF LONG BEACH, a municipal corporation

Aug 27, 2009

By _____
Assistant City Manager

City Manager

"City"

EXECUTED PURSUANT TO SECTION 301 OF THE CITY CHARTER.

This Contract is approved as to form on Aug. 26, 2009.

ROBERT E. SHANNON, City Attorney

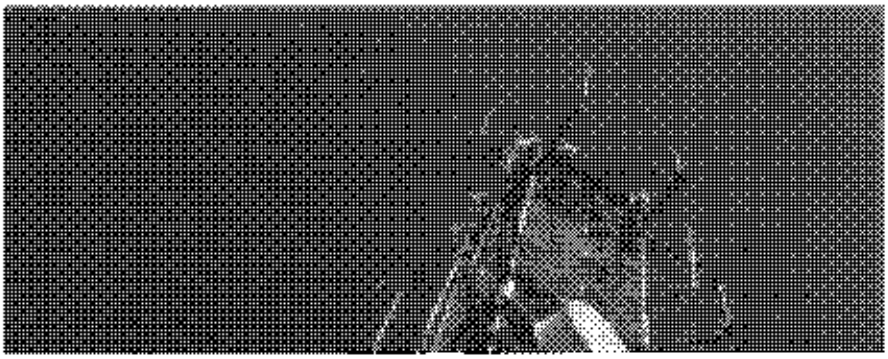
By _____
Deputy

OFFICE OF THE CITY ATTORNEY
ROBERT E. SHANNON, City Attorney
333 West Ocean Boulevard, 11th Floor
Long Beach, CA 90802-4664

EXHIBIT "A"

City of Long Beach
Proposal for FRP No. FD09-041
For
Public Safety Microwave Networks

Proposal Specially Prepared for :
City of Long Beach
Purchasing Department
333W Ocean Blvd/ 7th Floor
Long Beach CA 90802



Presented by:

Charles Margiotta
Sale Manager

VISLINK
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City of Long Beach Purchasing Department
RFP # FD09-041 Public Safety Microwave Network

City of Long Beach
Request for Proposal Number FD09-041
For
Public Safety Microwave Network

Company Name Vislink Services Contact Person: Charles Margiotta

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VISLINK
Services

City of Long Beach Purchasing Department
RFP # FD09-041 Public Safety Microwave Network

June 26,2009

Letter of Transmittal

Lenore Blueford, Purchasing Division
City of Long Beach Purchasing Division
333 W Ocean Blvd/7th Floor
Long Beach CA 90802

Dear Lenore Blueford:

Vislink Service submits the attached proposal in response to your request for proposal for a Public Safety Microwave Network RFP number FD09-041 dated June 30, 2009.

The format and content of the proposal complies with the requirements in the RFP, and establishes the fact that Vislink Services is fully capable of delivering an accurate, detailed, precise, complete State of the Art, NERA; one that will meet your needs to further your efforts implementing a highly reliable, secure microwave communications network for your public safety needs. Vislink Services has over 20 years of experience in the microwave communications business.

We look forward to working with you to make your project a reality.

If you have additional questions, please feel free to contact our representative:

Charles Margiotta
Vislink Services
526 W. Blueridge Ave
Orange,CA 92865
714-988-2121 Ext 205

Sincerely,

Christopher Gibbons
Presi

VISLINK
Services

City of Long Beach Purchasing Department
RFP # FD09-041 Public Safety Microwave Network

REFERENCES

Hillsborough County / Clerk of Courts, FL
c/o James A. Eatrides, CEO
Alpha-Omega Communications, LLC
6842 Gulf of Mexico Drive
Longboat Key, FL 34228
Cell 941-350-9618 Office 941-383-8223 x201
Fax 941-383-8232
Jim@alpha-omegacom.com www.alpha-omegacom.com

Charlotte County FL
c/o >James A. Eatrides, CEO
Alpha-Omega Communications, LLC
6842 Gulf of Mexico Drive
Longboat Key, FL 34228
Cell 941-350-9618 Office 941-383-8223 x201
Fax 941-383-8232
Jim@alpha-omegacom.com www.alpha-omegacom.com

Miami - Dade County FL
c/o Victoria Youtz, Sales Manager
Business Information Group, Inc. / BIG Wireless, LLC
Phone:717-849-1022
Cell:717-577-0785
Fax: 717-854-1313
156 North George Street
York PA 17401

City of Miami Beach
c/o James A. Eatrides, CEO
Alpha-Omega Communications, LLC

	Single T1/E1 with 5 and 10 MHz channels; dual T1/E1 with 20 MHz channel
Management & Installation	
LED indicators	Power status, Ethernet link status and activity
System management	Web or SNMP V1/2c using MIB-II and proprietary PTP MIB; Canopy® Prizm
Installation	Built-in audio and graphical assistance for link optimization
Connection	Distance between outdoor unit and primary network connection: up to 330' (100 meters)
Physical	
Dimensions	Integrated Outdoor Unit (ODU): Width 14.5" (370 mm), Height 14.5" (370 mm), Depth 3.75" (95 mm)
	Connectorized ODU: Width 12.2" (309 mm), Height 12.2" (309 mm), Depth 4.1" (105 mm)
	Powered Indoor Unit (PIDU Plus): Width 9.75" (250 mm), Height 1.5" (40 mm), Depth 3" (80 mm)
Weight	Integrated ODU: 12.1 lbs (5.5 kg) including bracket
	Connectorized ODU: 9.1 lbs (4.3 kg) including bracket
	PIDU Plus: 1.9 lbs (864 g)
Wind speed	202 mph (325 kph)
Operating temperature	-40°F (-40°C) to +140°F (+60°C), including solar radiation
Power supply	Integrated with Indoor Unit
Power source	90–240 VAC, 50–60 Hz / 36-60V DC
Power consumption	55 W max
Environmental & Regulatory	
Protection and safety	UL60950
Radio	FCC Part 27

Cambria County
c/o Conxx
Brent Mortensen
President
CONXX, Inc.
Phone:1 951 323.3832

Jack Masser
Loudoun County
Transportation Dept.
Communication Dept.
42000 Loudoun Center Place
Leesburg, VA 20175
Phone-703-771-6480, ext. 123
Fax - 703-779-7883
"Jack Masser" <Jack.Masser@loudoun.k12.va.us>

Floyd Ritter
State of Utah
Strategic Network Planner
phone 801-965-4048
cell 801-514-0964
fritter@utah.gov

Bret Mills
Emery County Sherrifs Office
IT Manager
(435) 381-5026
bmills@ecso.com

Jody Davis
South Central Communications
jodyd@socen.com
(435) 676-0505

Organization Profile and Qualifications

Vislink Services has been a provider of microwave communications services since 1990, giving us the business stability to be a long-term partner with the City of Long Beach. Our stringent focus on safety is designed to reduce risk to the City of Long Beach on major projects such as this one.

Vislink Services is proud to be a member of a group of leading technology companies that design, manufacture and install fully reliable terrestrial microwave networks for some of the most extreme and high-pressure situations on Earth. The Vislink Group has brought together five leading technology companies, each one a leader in their own field.

Based in Orange County, California; San Francisco, California and Tampa, Florida, Vislink Services specializes in the design, integration and maintenance of microwave, satellite and wireless communications systems for television broadcast, public safety, defense, and business applications. These systems include; terrestrial point-to-point microwave, electronic news-gathering (ENG), outside broadcast (OB), defense, airborne law enforcement and security (DLES) surveillance, satellite uplink/downlink, Doppler radar, fiber-optic and associated control systems.

Vislink Services' experience and reputation in North America and Mexico has been recognized globally. In order to accommodate the growing demands of our clients, our specialized services are now being offered to most international markets.

Each member of the Vislink Services sales, engineering, integration and service team has the knowledge and experience to meet and exceed our clients' expectations.

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RFP # FD09-041 Public Safety Microwave Network

Project Experience with Similar programs

City of Los Angeles – ITA

Sheeba Varughese – Engineer
Tel: 213-978-4018 / 562-505-4020

City of Los Angeles – LAFD Air Operations

Joseph Foley – Fire Chief
Tel: 818-756-8635

City of San Diego – Communications Division
Huw Williams – Engineer
Tel: 619-525-8582
huww@sandiego.gov

2008 - Currently under contract to integrate over (20) digital helicopter video down-link systems throughout the County of San Diego in the 2.3 GHz band. These systems are being installed at City, County, State, Federal & Military facilities throughout the region for use in joint response situations.

City of Irvine – Police Department
Mike Hallinan – Police Sergeant
Tel: 949-724-7166
mhallinan@ci.irvine.ca.us

2008 - Provide engineering and integration services for mobile command center microwave downlink system. Completed the installation of a custom 2 & 7 GHz steerable microwave downlink system to receive surveillance information from City/County/News aircraft.

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City of Long Beach Purchasing Department
RFP # FD09-041 Public Safety Microwave Network

Team Identification

Vislink Services will provide an experienced, technically-adept staff of installers, technicians, engineers, and managers to perform the alignment, installation, and testing of the new systems. At Vislink Services we are committed to exceeding our client's expectations and we take different measures to achieve an unsurpassed level of client satisfaction. We provide cutting edge technology solutions while making safety our primary goal. Our professional staff possesses years of service and integration experience as well as numerous certifications so you can rest assured that you will be working with a well-rounded team.

Blake Blakesley – Program Manager

system engineering has helped Vislink Services to be successful over the years and has also attributed to our customers success.

John Goodwyn – Systems Engineer
John received his basic electronics and advanced microwave systems training in the United States Air Force. He has served as a field technician, customer service engineer and field service engineer before joining the Vislink Services team. He is proficient in all facets of microwave communications systems including, RF equipment, multiplexers, channel banks and ATM networking. John's technical ability and common sense allows him to solve some of the complex problems associated with the industries equipment.

Clay Thomas – Systems Technician
Clay received his basic electronics and advanced systems training in the United States Army. He served in the Net Com/Army Signal Command as a field technician in the United States, Iraq, Kuwait, Afghanistan, Germany, Spain, Greece & Korea before joining the Vislink Services team. He is proficient in all facets of microwave communications systems, fiber optics, LANs, routers, switches, multiplexers, channel banks and ATM networking. Clay is a loyal and dependable leader with a "take charge" attitude. He is capable of handling multiple tasks with determination that yield outstanding results.

Licenses:
Business
Contractors
Resale

Certifications:
Connectorization
Fork Lift Instructor
Tower Climbing Safety & Rescue
CPR / First Aid
RFR Hazard Safety in the Communications Industry
Non-Ionizing Radiation Safety for the Telecommunications Industry

Banking information:
Citizens Business bank
1201 E Katella Ave
Orange, Ca 92867

year warranty of on site, full warranty which includes providing and installing all manufactures upgrades available during this period.

(Narrative/Technical Proposal)

Scope of Work

Description of all equipment that will be provided and Services by Vislink Services

Vislink Services has evaluated microwave technical requirements for the primary installation sites. The sites include Signal Hill, LBFD Mobile Command Communication vehicle, Long Beach Fire Department Regional Training Center, Downey Fire Department, Regional Training Center, the Long Beach Fire Department Fire Headquarters Training Room. The preliminary needs for the installation sites are to include the following.

Project Specifications and Technical Requirements, this project is engineered, and designed by Vislink Services and all equipment is furnished and installed for a multiple-path 10/11 GHz digital microwave radio system between the Long Beach Fire Department Training Center, City of Long Beach Signal Hill Transmitter Site, and the Downey Fire Department Training Center in Downey, California. This equipment will be Harris True-point 11GHz protected radios and shall provide a capacity of (2) 10/100 Base T Ethernet circuits plus as many as 16 X DS-1 circuits, based on transmission needs. One way reliability performance of the link for both multipath and rain outage shall be not less than 99.999% at a bit error rate (BER) of 10e-6.
The principal payload will be 2 10/100 Base T Ethernet Circuits, plus up to 16 DS-1 circuits.

[redacted]

[redacted] atmospheric disturbances [redacted] The Motorola Wireless Broadband portfolio offers [redacted]

LBFD Regional Training Center: 100 T-1 equivalents hot running standby Harris Turepoint 5211
Downey Regional Training Center: 100 T-1 equivalents hot running standby Harris Turepoint 5211
LBFD Fire Headquarters: 300 Mbs equivalents Motorola PTP54660 or PTP49600
Note: The Signal Hill communication site is a high RF environment. It has 48v DC / 12v DC
battery power at the site. Air conditioned enclosure. 120v power has UPS generator backup.

There is adequate space for additional components in the City's existing cabinet. Installation crew must be certified to climb tower and have experience in working in a high RF environment.

Equipment & Installation

- Install 2 ea. 11 GHz links for Downey and Long Beach Fire Training @ 50-100 foot level
- Install 4.9 GHz central receive antenna system or equivalent at the 165 foot level of tower
- Install control and RF cabling, and connectors for steer-able and fixed system antennas
- Install 4.9 antenna controller or equivalent in Signal Hill equipment room including
Ability to respond to "request for service" from command center
Ability to power on/off receive site microwave radio
- Install site link controller radio or equivalent with associated cabling
- Install Power supply, base station antenna, cabling and connectors for sync radio
- Lightning Protection (antenna control, radio RF) if necessary
- Complete system to include site surveys, installation, system calibration, testing, training, documentation (manuals, software, licenses, as-built drawings).

At the Long Beach Fire Training Center site, the indoor equipment (IDU) and outdoor equipment (ODU) Harris microwave equipment model True-Point all indoor; will be installed in a ventilated equipment room environment, with no special HVAC. The antenna is to be mounted on the roof of a single story building using a non-penetrating tripod to be provided. Waveguide Andrew EW90 will be used with waveguide connectors (approximately 50') and conduit between the antenna and equipment will be provided and installed as required. Wiring, conduit, and circuit breakers for the two (2) 240VAC back up input circuits for the –48 VDC power plant shall be provided and installed. 4 hours of power will be provided from a vendor supplied -48 VDC battery power system in a vendor provided rack.

LB Fire Training Center Exhibit #3
Microwave

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City of Long Beach Purchasing Department
RFP # FD09-041 Public Safety Microwave Network

Harris True-Point, Point-to-Point 11 GHz, 155 Mbps link from the LB Fire Training Center to Signal Hill. This link is to connect Signal Hill to LB Fire Training Center. These Harris True-Point digital microwave radios shall provide capacity for at least 2 10/100 Base T Ethernet circuits plus as many as 16 X DS-1 circuits, based on transmission needs.

Path Calculations with Profiles, Provided See page ( )

Long Beach Fire Department 33-47-53.86N 118-08-11.32W

Distance in miles

The Long Beach Fire Department (LBFD) intends to upgrade the existing 4.9GHz analog mobile microwave network to a point-to-point 4.9 GHz public safety band *digital* microwave network with Motorola PTP49600 and tracking antennas system.
automatic connectivity to + 20 miles with over 20 mbps throughput. Our goal is to allow relatively unskilled operators to establish precise links with minimal effort.
The Long Beach Fire Department currently owns a mobile command & communications vehicle (MCC) with a Millennium 4A20 4.9 Gig 20 dbi gain antenna and pan/tilt on a 42-foot extendable mast. The mast is equipped with a Nycoil, which does not have any spare Ethernet cable installed. A QuickSet controller powers its existing pan/tilt with remote control connector.
Install positioning components linked to existing equipment to provide a fast, accurate, automatic positioning solution. This system should require three keystrokes or less to automatically align *both* the command center and receive site antennas. In addition,

signal auto-peaking and remote microwave radio power up/power down should be available to the mobile operator. A 165 foot tower on Signal Hill will be the central receive antenna location.

Equipment & Installation

• Microwave Controller – mounted in the vehicle rack for control
Ability to automatically orient Vehicle receive antenna to connect the subscriber modules
path to the Signal Hill access points in the 4.9 GHz licensed band to connect vehicles microwave link.
Ability to auto-peak signal path
Ability to Remotely power on / off the receive sites access points
• Microwave controller cable with connectors
• Microwave controller sensor module behind the antenna atop the mast
• RF link radio compatible with the controller
• Power supply, antenna, cabling and all system connectors to interconnect
• Connect the sensor module to the rack mounted microwave controller
• Modify Nycoil configuration as required
• Install a point to point subscriber module with OFDM technology, on existing mast platform:
Specification of subscriber module - To connect the command
vehicle to the Signal Hill access points using the 4.9 GHz licensed band within a radius of
+20 miles of the Signal Hill access point. To achieve this it can be either vertical or horizontal polarization. The Signal Hill access points to be at the 165 foot level of the existing communications site tower. This link is to connect vehicles video surveillance, VOIP phones and teleconferencing equipment, and mission-critical backhaul applications to

the City's infrastructure as well as T1/E1 ports to provide low latency for the voice quality
that is crucial for supporting critical public safety applications such as 9-1-1 and disaster recovery efforts.

Mobile Command Communication Vehicle (MCC) Exhibit #2
Microwave

Link needs to provide mostly a latency of less than two milliseconds at a bandwidth of 20
Mbps. Security concerns to be able to protect data with FIPS 197 certified AES 128-bit secure access to our private network. This may require point to point or near-line-of-sight
(nLOS) coverage in locations where obstructions or environment issues have previously limited wireless broadband access. System Management: Web or SNMP v1/v2c using MIBII

and proprietary PTP MIB;
Data rate can't drop below 6 Mbps within the radius of +20 miles in near-line-of-sight (nLOS) coverage in locations
Latency within the radius of +20 miles in near-line-of-sight (nLOS) coverage in locations can be no less than four milliseconds
System must meet power over Ethernet requirements
Replace existing approximately 75-ft.antenna cable or add to existing Rectus Tewa Nylon 1" Red Nycoil any additional cables as required for automatic positioning, powering and receiving signal from the new mast mounted radio. In the unlikely event that a new Nycoil is required, it must match the Red color of the existing Nycoil that currently appears to be in very good condition. Connections through existing Nycoil are believed to include:
Quickset controller cable
Power & RF to mast camera (2) wires
Antenna cable Proximity warning device sensor cable

Downey Fire Training Center Exhibit #4
Microwave

Point-to-Point 11 GHz, 155 Mbs link from the Downey Fire Training Center to Signal Hill. Harris Truepoint 5211 digital radios The Signal Hill level to be around 50-100 foot level of the existing communications site tower, depending on the path study. This link is to connect Signal Hill to the Downey Fire Training Center. Payload capacity of at least 2 10/100 Base T Ethernet circuits plus as many as 16 X DS-1 circuits, based on transmission needs. Bidder must provide as part of its submission:
Point-by-Point response to each section and subsection of this RFP. Bidder must state compliance to each requirement with a "Comply" or "Not Comply" response, with any

additional information that is relevant to the response. No partial compliances are allowed. Path Calculations with Profiles Equipment Rack Profiles Block Diagrams Power Consumption Calculations Pricing Spreadsheet Downey Fire Training Center 33-55-46.1N, 118-08-50.2W, Paramount Blvd. Site Elevation ? Downey, Ca Antenna Centerline Height 8-12 Ft. above roof (Use Existing roof mounted tower) Signal Hill Radio Site 33-47-57.94N, 118-09-46.53W, 2321 Stanley Ave. Site Elevation 354', Tower height 165' Signal Hill, Ca Antenna Centerline Height 50-100 Ft. above ground, depending on path study. (Mounted on existing 165' tower, mount required) The antenna is to be mounted on the roof of the Training Center building using a nonpenetrating tripod to be provided. Cable routing to be determined during job walk through. Page 1 of 2 34

Exhibit #4

Wiring, conduit, and circuit breakers for the two (2) 240VAC input circuits for

0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5 1.6 1.7
Range on path (miles)

	Throughput to Long Beach Fire Headquarters	Throughput to Signal Hill Communications Site
Mean IP Predicted	75.1 Mbps	75.1 Mbps
Mean IP Required	70.0 Mbps	70.0 Mbps
Min IP Required	20.0 Mbps	20.0 Mbps
Min IP Availability Predicted	99.9999 %	99.9999 %
Min IP Availability Required	99.9900 %	99.9900 %

Link Summary			
System Gain Margin	56.21dB	Total Path Loss	115.18dB
Free Space Path Loss	115.18dB	Mean Aggregate Data Rate	150.2Mbps
Excess Path Loss	0.00dB	Link Availability	99.999950 %

at around 300 Mbs. System Management: Web or SNMP v1/v2c using MIB-II andproprietary PTP MIB. Power Requirement: -48 Volt operation
Bidder must provide as part of its submission:
Point-by-Point response to each section and subsection of this RFP. Bidder must state compliance to each requirement with a "Comply" or "Not Comply" response, with any additional information that is relevant to the response. No partial compliances are allowed.
Path Calculations with Profiles
Equipment Rack Profiles Block Diagrams
Power Consumption Calculations Pricing Spreadsheet
Fire Headquarters 33-48-54.6N, 118-08-23.44W
3205 Lakewood Boulevard Site Elevation (TBD)
Long Beach, Ca. 90808
Signal Hill Radio Site 33-47-57.94N, 118-09-46.53W,
2321 Stanley Ave. Site Elevation 354', Tower height 165'
Signal Hill, Ca Antenna Centerline Height 50 Ft. above ground (Mounted on existing 165' tower, mount required)
The antenna is to be mounted on the roof of a Two story Hanger building using a nonpenetrating tripod to be provided. Cable routing to be determined during job walk through.(approximately 200')
Page 1 of 2
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Exhibit #5

Wiring, conduit, and circuit breakers for the two (2) 240VAC input circuits for the –48 VDC power plant shall be provided and installed. 8 hours of power will be provided from a vendor supplied -48 VDC battery power system.
1 Ea Eltek 504560-2401, 200A Flatpack FP3UD
2 Ea Eltek 241114.100, Flat Pack SL1 Plug-In SM Rectifier DC Power
1 Ea Eltek 505861, Kit: Webpower 1U SKU
2 Ea Eltek 101054, Blindpanel Front Flatpack 1500
1 Ea Eltek 502666, Circuit Breaker: 100A Plug-in battery breaker
1 Ea Eltek 502655, Circuit Breaker: 20A 1P AUX 5/16 Bullet Breaker
1 Ea 19" x 7 ' Rack
1 Ea Battery Tray 19" Rack
4 Ea ENERSYS 12VE115F-FR POWERSAFE, 12-volt sealed battery cell

All equipment provided by the Vislink Services shall be warranted against defects in material and workmanship for a minimum of one (1) year for parts and labor. The warranty period shall begin on the date of link system acceptance. All other terms and conditions of warranty shall be provided in the bid response.

Link Summary			

Comply or Not Comply

6. PROJECT SPECIFICATIONS and TECHNICAL REQUIREMENTS

6.1 General Information
The digital microwave radio shall be designed to meet the requirements for capacity of 155 Mb/S - 2 10/100 Ethernet Circuits + up to 16 X DS-1. The radio shall be suitable for two-frequency, full-duplex operation.
The radios shall have an outdoor RF transceiver (Radio Frequency Unit – RFU) and a Signal Processing (baseband) unit (SPU), connected by two coaxial cables in a protected configuration. The RFU shall be able to be installed indoors if required.
The RF transceiver shall be modulation and capacity independent for each band and shall be programmable from 4 DS-1s to OC-3 capacity to reduce the sparing cost.
The radio shall include transmitter, receiver, modem, power supply, multiplexer, controller, service channels/orderwire, and all associated interconnections.
All previous mentioned modules shall be redundant except for the controller and service channels, The radio shall cooled by convection, and shall not have fans to reduce the

operating temperature. (Comply)

6.2 Frequency Bands
Band Frequency Range Frequency
Spacing
Channel Spacing
11 GHz 10700 - 11700 MHz 490, 500, 530 2.5, 3.75, 5, 10, 30,
10 Rev 02-23-09
Band Frequency Range Frequency
Spacing
Channel Spacing
MHz 40 MHz (Comply)

6.3 Digital Transmission Rates, Bandwidth and Interfaces (Comply)

6.3.1 Channel Bandwidth.The radio shall have a flexible modulation scheme allowing channel capacity and (Comply) bandwidth changes without changing the modem/power supply module. Changes to the channel bandwidth and/or interface shall be done via pull-down menu options. The radio shall facilitate transmission of Time Division Multiplex (TDM) circuits and Transmission Control Protocol / Internet Protocol (TCP/IP) circuits. Total available bandwidth per radio shall not be less than 155 Mb/S. The radio shall be capable of transporting the following payloads in the 11 GHz band:
Bandwidth
(MHz)
Capacity

2.5 4xDS1, NxDS1 + 2 x 10/100 Base T/ over 4xDS1 air link equivalent
3.75 8xDS1, NxDS1 + 2 x 10/100 Base T/ over 8xDS1 air link equivalent
5 12 or 16 x DS1+ 2 x 10/100 Base T/ over 12 or 16 x DS1 air link equivalent
10
20
16xDS1, NxDS1 + 2 x 10/100 Base T over NxDS1 air link equivalent
ADM 8xDS1 + 1 x DS1, 28xDS1 + 1xDS1, 2 x 10/100Base T over 45Mbps + 1xDS1, DS3 + 1xDS1
30
40
28xDS1 + 1xDS1, 3xDS3 + 3xDS1, STS-3 + 1xDS1, OC3 + 1xDS1, 2 x 10/100 Base T + NxDS1
ADM 8xDS1 + 1 x DS1, 28xDS1 + 1xDS1, 3xDS3 + 3xDS1, STS-3 + 1xDS1, OC3 + 1xDS1, 2 x 10/100

Base T + NxDS1 (Comply)

6.3.2 DS-1 Interface
The line code on each individual DS-1 line shall be software selectable for either AMI or B8ZS operation. The line build-out (LBO) on each individual DS-1 shall be software-selectable as to length.
Each individual DS-1 shall be software-selectable as either active or inactive status.
In the event the DS-1 source to the DS-1 input fails the radio shall exhibit an alarm.
11 Rev 02-23-09 (Comply)

6.3.3 Ethernet Interface
The digital microwave radio shall be able to terminate two 10/100 Base T Ethernet circuits on a standard RJ-45 physical interface. (Comply)

6.4 Applicable Standards
The Radio shall meet the applicable requirements and standards of the following: (Comply)

6.4.1 Radiated and conducted susceptibility (Comply)

6.4.1.3 ESD: IEC/EN 61000-4-2 (IEC 801-2, level 4); EN 55101-2 (Comply)

6.4.1.4 GR-1089-CORE (section 3.3 & 3.5) (Comply)

6.4.2 Radiated Emissions (Comply)

6.4.2.1. CISPR 22, class B (Comply)

6.4.2.2. FCC part 15, subpart B, class B (Comply)

6.4.2.3. GR-1089-CORE (section 3.2.1, 3.2.2 &3.4) (Comply)

6.4.2.4. Canada: ICES-003, Class B (Comply)

6.4.2.5. ETSI EN 301 489-01 & ETSI EN 301 489-4 (Comply)

6.4.3 Safety (Comply)

6.4.3.1 EN60215 (Comply)

6.4.3.2 EN60950 (Comply)

6.4.3.3 CSA C22.2 no.950.95 (Comply)

6.4.3.4 UL 1950 (Comply)

6.4.3.5 GR-1089-CORE, section 7 (Comply)

6.4.3.6 IEC 60825 class 1 laser (Comply)

6.5 Unfaded Bit Error Rate
In the absence of fading, the BER shall not be greater than 10e6 per Hop or link across the entire specified temperature range. (Comply)

6.6 Jitter Requirements Radio terminals and multiplex shall meet the requirements outlined in the following specifications: (Comply)

6.6.1 Jitter transfer and tolerance conforms to ITU-T G.783, G.825 and G.823. (Comply)

6.6.2 Jitter generation conforms to ITU-T G.783, G.825, G.751 and G.742. (Comply)

6.7 Severely Errored Seconds (SES)
A one-way, 1-hop system, not subject to the effects of radio fading, shall produce no more than one SES in a 24-hour period, measured at the DS-1 level, during the first year of service. A severely-errored-second is defined as a 1-second interval which contains ≥30% errored blocks, which translates to at least 2500 bit errors during 1 second at the 155 Mb/s level.
12 Rev 02-23-09 (Comply)

6.8 Protection and Recovery (Comply)
6.8.1 In a hot standby radio the modules shall be protected at the RF, IF and Mux levels. (Comply)
6.8.2 Radio receivers shall provide both manual and fade initiated automatic errorless switching to the protection unit. (Comply)

6.8.3 Recovery of a system from prolonged (greater than 1 min) RF signal loss shall take place within 250 milliseconds after a valid signal is restored. (Comply)

6.8.4 The average recovery time for switching caused by hardware failures in a protected system shall be 60 milliseconds or less. (Comply)

6.8.5 The Radio shall be designed so that protection circuits and units not in service or operation can be tested and repaired without affecting the on-line system operation. (Comply)

6.8.6 Partial or complete failure of protection control shall not render the microwave link inoperable. (Comply)

6.9 Electromagnetic Interference (Comply)

6.9.1 The radio shall be operationally compatible with the following types of equipment located in the same shelter: (Comply)

6.9.1.1 FDM-FM Microwave (Comply)

6.9.1.2 VHF Mobile Base Stations (Comply)

6.9.1.3 UHF Mobile Base Stations (Comply)

6.9.1.4 VHF/UHF Hand-held Radios (Comply)

6.9.1.5 Paging/Short Messaging Transmitters (Comply)

6.9.2 The radio shall not emit Radio Frequency Interference (RFI) to any of the types of equipment listed above at any level above that permitted under FCC Part 15, Subpart B for Class A devices, CISPR22, Class B, ETSI EN 301489-01, ETSI 301489-4 and the future European harmonized EN 302 317-2-2.
13 Rev 02-23-09 (Comply)

6.9.3 The equipment offered shall be capable of meeting full specifications when operating in the general vicinity of FM and TV transmitters and vehicular mobile UHF/VHF transmitters where their emitted RFI does not exceed the level specified in Bellcore TR-EOP-000063, IEC/EN61000-4-3, & IEC/EN61000-4-4. (Comply)

6.10 General requirements Description of the Company
The manufacturing facilities for microwave equipment shall be certified to the ISO 9000 quality standard. Bidder shall provide a brief history of their company; its products and services; its customer support and repair and return policies, and a statement of its financial condition.
The microwave radio manufacturer shall be experienced and been in the industry for at least 10 years as a direct manufacturer of microwave radios and equipment.

List of References
Bidder shall provide a list of five customers, including telephone number and person to contact, for whom the products quoted have been installed and carrying traffic for at least at least 1 year. Point of Manufacture
Bidder shall state the location (city, state/province, country) where the proposed equipment is manufactured. Test Equipment and Spare Parts
Bidder shall provide a list of tools and test equipment (common and specialized) necessary to install, operate, and maintain all equipment proposed in the quotation. A list of all recommended spare parts and replaceable modules required to adequately support the system shall be supplied by the Bidder. Any frequency specific units shall be listed separately, and line item prices shall be given for each unit. Bidders shall state how long they are willing to hold quoted prices.
In addition, bidder must propose a handheld VT100 type terminal device, other than a laptop, that the technicians may keep in their toolbox to provide user access for configuration, monitoring, and control of the radio. Technical Training
The Successful Bidder shall provide a comprehensive Factory Training Program. Classes shall be conducted with substantial hands-on involvement.
The course content shall include the following, as a minimum: (Comply)

6.10.1 Bidder's documentation structure, numbering system, and configuration control system. (Comply)

6.10.2 Principles of digital transmission. (Comply)
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6.10.3 Block diagram and circuit description - all units. (Comply)

6.10.4 Installation and turn-on procedure. (Comply)

6.10.5 Alignment and testing procedure. (Comply)

6.10.6 Trouble diagnosis to modular level. (Comply)

6.10.7 Unit replacement procedure. (Comply)

6.10.8 Operating, safety, and traffic continuity procedures. (Comply)

12. ENVIRONMENTAL
The Equipment shall function properly under the following environmental conditions:
19 Rev 02-23-09 (Comply)
12.1 Temperature:

12.1.1 Operating Range IDU: -5°C to +50°C (Comply)
12.1.1 Operating Range ODU: -33°C to +55°C (Comply)
12.1.2 Storage: -50°C to +65°C (Comply)
12.2 Humidity
5% to 95% non-condensing (Comply)
12.3 Altitude
0 to 16,400 ft. (5000 meters) AMSL (Comply)

Automatic Transmitter Power Control (ATPC) shall be available for a 10 dB range to ease frequency coordination in congested areas and reduce interference levels without the use of attenuators or high performance antennas. It shall be possible to disable this feature. The transmitter output power shall be software adjustable using a handheld terminal device (other than a laptop), VT-100 Terminal, or PC with VT-100 emulator to reduce the need for attenuators on short paths. (Comply)
13.3 Frequency Source
The frequency source shall be synthesized. Frequency stability shall be equal or better than ±5 ppm over the temperature range of -33° to +55° C. (Comply)
13.4 Reverse Path Protection
Reverse path protection software shall enable a hot-standby radio to automatically switch from the on-line Transmitter to the standby Transmitter when the Receiver has a sync loss alarm caused by a silent failure at the transmit end. (Comply)
13.5 Error Correction
Forward Error correction shall be employed to ensure a low intrinsic error rate and improved threshold. (Comply)
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14. RECEIVER
14.1 Threshold
The Radio shall have a guaranteed receiver threshold (BER = 10^{-6} Non-protected, Guaranteed over specified temperature range): (Values must be guaranteed)
Frequency/
Capacity 4 DS1 8 DS1 16 DS1 28 DS1 /
1 DS3 3xDS3 OC-3
10/11 GHz -88 dBm -83 dBm -76 dBm -75 dBm -71.5
dBm
-70 dBm (Comply)
14.2 Interference Criteria
The maximum T/I ratio data for Like Signal frequency offsets from the desired signal (Guaranteed @ 25°C, at 10^{-6} BER), shall be provided for the radios proposed by the bidder. (Comply)
14.3 Equalization
Each radio shall be equipped, as standard equipment, with an automatic time domain equalizer (ATDE) to mitigate the effects of dispersive fading. (Comply)
14.4 Differential Absolute Delay Equalizer (DADE)
The radio shall have an automatic delay and phase equalizer to align the spacediversity

receiver signal automatically for a diversity antenna spacing of up to 150 feet. (Comply)

14.5 Receiver Diversity Switching

The receiver shall be designed to ensure that the receiver with the better performance is operational at any given moment. The receiver shall monitor the incoming RF/IF signal for signal degradation (including but not limited to eye-quality monitor alarm, RSL threshold alarm, and slope alarm) and initiate a receiver switch before errors occur. The transfer to the alternate receiver shall be without errors. The Bidder shall describe, in detail, how this shall be accomplished. (Comply)

14.6 Frequency Source

The frequency source shall be synthesized. (Comply)

14.7 Dispersive Fade Margin

The Dispersive fade margin for the proposed radios at 10^{-3} BER with multipath delay of τ = 6.3 ns shall be provided by the Bidder. (Comply)

Float Charging Voltage	2.25Vpc to 2.27Vpc @ 77°F (25°C)
Charging Temperature Compensation	-2 mV/cell/°F > 77°F (-3.6 mV/cell /°C > 25°C) +2 mV/cell/°F < 77°F (+3.6 mV/cell/°C < 25°C)
Equalize /Cycle or Freshening at Installation Charging Voltage	2.35Vpc to 2.40Vpc @ 77°F (25°C) See Operations and Maintenance Manual for specific guidelines and recharge times
Maximum Charge Current	C_5 Rate Amps (5 hour rate @ 1.75vpc)
Maximum AC Ripple (Charger)	0.5% RMS, 1.5% peak-to-peak for float charge voltage for best results Maximum AC ripple voltage allowed 4% P-P
Self Discharge Rate	<2% per month at 77°F (25°C)

The handheld terminal device (other than a laptop), VT100 terminal or laptop with VT100 emulator shall provide a means to control the following functions: (Comply)
15.4.1 Manual switching of on-line transmitters and receivers, locally and remotely, from all sites in a contiguous network. (Comply)
15.4.2 Adjustment of local transmitter power output. (Comply)
15.4.3 Local IF electronic loop back. (Comply)
15.4.4 Local and remote tributary loop back. (Comply)
15.4.5 In-service BER calculation. (Comply)
15.4.6 Assignment of network element addresses. (Comply)
15.4.7 Select version of on-line software. (Comply)
15.4.8 Monitor alarms. (Comply)
15.4.9 Set and clear alarm or control relays. (Comply)
15.5 Built-in Test Facilities(Comply)
The radio shall provide the following functions as a minimum:
15.5.1 Tributary loopback, local and remote. (Comply)
15.5.2 Local IF electronic loopback . (Comply)
15.5.3 In-service BER calculation. (Comply)
15.6 External Alarms
Each radio assembly shall accommodate two isolated external site/housekeeping alarm inputs (contact closures). (Comply)

15.7 Paperless Chart Recorder
In order to correlate path activities during a period of time and the alarm activities during the same time, the radio shall include a way to electronically log information regarding Received Signal Level (RSL) and alarm conditions for display on a computer screen as an electronic chart recorder (Period of time or quantities of samples to be stated by the Bidder). (Comply)
15.8 External Controls/Alarms

Each radio assembly shall have four relay outputs that shall be customerconfigurable for either alarm or control use. (Comply)
15.9 RSL Test Points
Test points for each receiver shall be available for attaching a multi-meter for voltage readings to approximate measuring of RSL for antenna alignment. (Comply)
15.10 Automatic Provisioning
A replacement module shall be automatically configured/provisioned identical to the removed module. No straps, switches, or adjustments shall be required. If a Control Processor Unit (CPU) is replaced, the radio shall have all settings for all units stored elsewhere in the radio so that the replacement CPU is automatically provisioned. (Comply)
15.11 Remote Inventory:

15.12 Remote Software Download
The radio shall be capable of storing two software copies; one copy shall be the operating software, and the other copy shall be the off-line software. It shall be possible to remotely download a new off-line software version, and to remotely make the off-line software the operating software and vice-versa, at anytime. (Comply)
15.13 SNMP Network Management
The radio shall have an embedded SNMP capability for connection to an open NMS system, such as HP OpenView. An external SNMP proxy is not preferred. (Comply)

16. SERVICE CHANNEL
16.1 Capacity
The service channel shall be digital and provide for a combination of two of the following types of service channel: (Comply)
- Voice orderwire
- Relay alarms
- 64 kb/s synchronous V.11
- 64 kb/s synchronous G.703
- 10Base-T over 64 kb/s

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16.2 Orderwire
At a repeater site when the orderwire is "on-hook" the digital service channel shall not convert the digital audio signal to analog and back to digital for retransmission; the PCM coded data shall pass directly through the station in a digital format. The orderwire shall provide the following: (Comply)
16.2.1 DTMF Signaling for up to 999 stations and remote "all call" and cancel features. (Comply)

16.2.2 Capability for use with standard 2-wire telephone handset. (Comply)
16.2.3 Built in ringing for standard telephone handsets. (Comply)
16.3 4-wire Voice Frequency Ports
The orderwire shall meet the following specifications: (Comply)
16.3.1.1 Input/Output Impedance: 600 ohms balanced(Comply)
16.3.1.2 Input/Output Levels: -16/+7 dBm and 0/0 dBm(Comply)
16.4 Data Ports
The service channel shall meet the following specifications: (Comply)
16.4.1 Provide Data Bridge(Comply)
16.4.2 EIA Standard RS-232C Interface(Comply)
16.5 Relay Alarms(Comply)
The service channel shall have:
- 12 digital inputs

• 12 relay outputs
or
• 30 digital inputs
• 6 relay outputs
16.6 64 kb/s Synchronous Channel
The service channel shall meet the following specifications: (Comply)
16.6.1 Electrical interface: V.11/EIA-422 100Ohms (balanced) point to point (Comply)
16.6.1.1 Speed: 64 kb/s (Comply)
16.6.1.2 Clock: Co-directional or contra-directional (TX clock output or input respectively) at 64kHz ±100ppm, non-composite (Comply)
16.6.2 Electrical interface: G.703 (Comply)
16.6.2.1 Speed: 64 kb/s (Comply)
16.6.2.2 Clock: Co-directional or contra-directional (TX clock output or input respectively) per G.703(Comply)
16.7 10Base-T over 64 kb/s
The service channel shall provide a bridged 10/100Base-T port to carry Ethernet traffic over a 64 kb/s channel.
24 Rev 02-23-09(Comply)

17. DC POWER
17.1 Operating Range
The equipment shall operate over the range of ± 21 to ± 60 VDC. The system shall be configured to operate at -48 VDC. (Comply)
17.2 Polarity
The radio shall operate without damage with reversed polarity battery connections. (Comply)

17.3 Power Feeds
In a protected radio each transmitter/receiver pair shall each have their own power

17.6 Fuses
All fuses and circuit breakers associated with DC distribution or the microwave terminal shall be of the indicating type and provide alarm contact closure upon opencircuit operation. (Comply)

18. EQUIPMENT MOUNTING
The Radios shall be designed to be installed in 7-foot high, 19-inch wide, aluminum phosphate-coated relay racks or in a customer-supplied mechanical structure. Racks shall be vendor provided and utilized at the Long Beach Fire Department Training Center and the Downey Fire Department Training Center. The equipment will be mounted in an existing cabinet at the Long Beach Signal Hill Radio Site. (Comply)
18.1 Fuse Panel
Each radio rack shall be equipped with a Fuse, Alarm and Distribution Panel capable of distributing two independent battery feeds to each DC/DC converter. Loss of one feed shall not affect operation of the radio. (Comply)
18.2 Interconnection
With the exception of coaxial connections, connector blocks or jacks and plugs shall be provided for all external connections. (Comply)

19. DOCUMENTATION
25 Rev 02-23-09
19.1 Manuals (Paper)
Manuals shall be provided for all furnished equipment, which include complete instructions for installation, testing, operation, trouble identification, repair and maintenance (if required). Provide 3 complete sets. (Comply)
19.2 Manuals (CD-ROM)
Manuals shall also be available in CD-ROM with Hypertext facility to jump to various manual sections. 3 complete electronic sets shall be provided. (Comply)

19.3 FCC licensing and frequency coordination shall be the responsibility of the City of Long Beach. (Comply)
19.4 Bidder must provide as part of its submission:
Point-by-Point response to each section and subsection of this RFP. Bidder must state compliance to each requirement with a "Comply" or "Not Comply" response, with any additional information that is relevant to the response. No partial compliances are allowed. (Comply)
Path Calculations with Profiles

harris stratex
Every Connection Counts.

TRuepoint™ 5000

Data Sheet

A new generation of point-to-point SONET / PDH / Ethernet digital radios

The TRuepoint 5000 series of point-to-point digital radios delivers highly flexible, highly reliable solutions for NxDS1 up to OC-3 and data communication links over a broad range of frequency bands from 6 to 38 GHz. This data sheet provides technical information about the TRuepoint 5000, including specifications, characteristics and applications.

Technical Specifications

Bit Rate Capacity: 4, 8, 12, 16, 28 DS1+1 DS1, 1 DS3+1 DS1, 3 DS3+3 DS1, OC-3+1 DS1, NxDS1+2x10/100BASE-T (4-100 DS1 equivalent capacity, ~6-155 Mbps)

Modulation: QPSK,16, 32, 64, 128 QAM

FEC: Low/medium capacity: Reed-Solomon
High capacity: Reed-Solomon concatenated with 2D or 4D (dimensional) TCM (Trellis Code Modulation) depending on bandwidth and system gain requirement

Top Terminal	V	Ah @ 8 hr to 1.75 77°F	Length (a)		Length Base (b)		Width (c)		Total Height (d)		Weight		Term. Type	Batt. Type
			in	mm	in	mm	in	mm	in	mm	lbs.	kg		
LDT12-7	12	7.4	5.94	151	-	-	2.56	65	3.98	101	4.74	2.2	F2	A
LDT12-28 *	12	28	6.50	165	-	-	4.93	125	6.89	175	22.0	10.0	M6-F	B
LDT12-30 *	12	32	7.70	196	-	-	5.10	130	7.10	180	23.2	10.5	M6-F	B
LDT12-45 *	12	52	9.02	229	-	-	5.44	138	8.46	215	40.0	18.0	M6-F	B
LDT12-70	12	72	10.20	259	-	-	6.65	169	8.41	215	52.0	23.5	M6-F	B
LDT12-80	12	86	12.09	307	-	-	6.65	169	8.50	216	64.0	29.0	M6-F	B
LDT12-90 *	12	94	12.02	305	-	-	6.62	168	8.35	212	70.0	32.0	M6-F	B
LDT12-100	12	96	12.64	321	-	-	6.78	172	8.75	222	70.4	32.0	M6-F	B
LDT12-125	12	128	13.43	341	12.90	328	6.80	172.5	11.34	288	91.3	41.5	M6-F	B
LDT6-200	6	200	12.68	322	-	-	6.93	176	9.09	231	70.6	32.0	M6-F	B

* Battery available with SLC Harness (-SLC to suffix) or with Charge Controller Harness (-CC to suffix)

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Technical Specifications

- **Operating Temperature Range:**

	Indoor	Outdoor
Guaranteed Performance:	-5° to +50° C	-33° to +55° C
Operational:	-10° to +55° C	-40° to +55° C

Humidity: 95% max, non-condensing

- **Power Source:** 21 to 60 Vdc negative or positive ground (auto-detection)
- **Power Consumption:** (SPU+RFU for high-capacity typical configuration)

	Unprotected	Protected
TRuepoint 5100:	59 Watts	111 Watts
TRuepoint 5200:	84 Watts	161 Watts

Regulatory Information

- **Frequency Plans:** SRSPs (Canada), FCC Part 101 and 74 (USA)
- **Digital Interface:** GR-499-CORE, GR-253-CORE
- **Electromagnetic Compatibility:** FCC Part 15, Subpart B (Class B), GR-1089-CORE, ICES-003 (Class B)

Mechanical Characteristics

Connections: SPU to RFU, coaxial cable with N-Type connectors

Dimensions:	Height			Width		Depth		Weight		
	inch	mm	RMS	inch	mm	inch	mm	lbs	kg	
SPU 1+0	1.8	45	1	19	483	10.2	258	7.3	3.3	
SPU 1+1	3.5	90	2	19	483	10.2	258	11.5	5.2	
TRuepoint 5100	13.9	358	8	9.5	245	4.7	122	13.4	6.0	
TRuepoint 5200	17.4	442	10	10.2	216	11.8	300	39.7	18	(2 TRs)

Antenna Characteristics

- **Detachable Configuration:** Off-the-shelf parabolic high-performance antenna from 1 ft. to 4 ft. (30cm to 1.2m) depending on frequency band. Uses latches for the antenna connection.
- **Separate Configuration:** Standard parabolic antenna. Uses waveguide or Flex Twist to interconnect radio and antenna. Radio flange interfaces are specified in the table below.

System Characteristics

Band (GHz)	Product Frequency Range (GHz)	Channel Spacing (MHz) (specify type at time of order)	Transmit/Receive Frequency Spacing (MHz)	Flange (EIA) Specification[1]	Waveguide[2]
L6	5.915 - 6.425	2.5, 3.75, 5, 10, 29.65, 30	251.875/252.04	CPR 137G	WR 137
U6	6.425 - 7.125	10, 20, 25, 30, 40	90, 100, 160,170, 180, 340, 345	CPR 137G	WR 137

RF Characteristics

Unless otherwise indicated, typical performance specifications are listed and apply to transmitters/ receivers connected back-to-back. Specifications must be confirmed before they become applicable

		Channel Spacing (MHz)									
		Frequency Band (GHz)									
Airlink Capacity	Modulation QPSK/QAM	L6	U6	7	8	11	13	15	18	23	38
4 DS1	QPSK					5		5	5	5	5
	16	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5
8 DS1	QPSK							10	10	10	10
	16			5				5	5	5	5
	32	3.75	3.75	3.75	3.75	3.75		3.75			

RF Characteristics

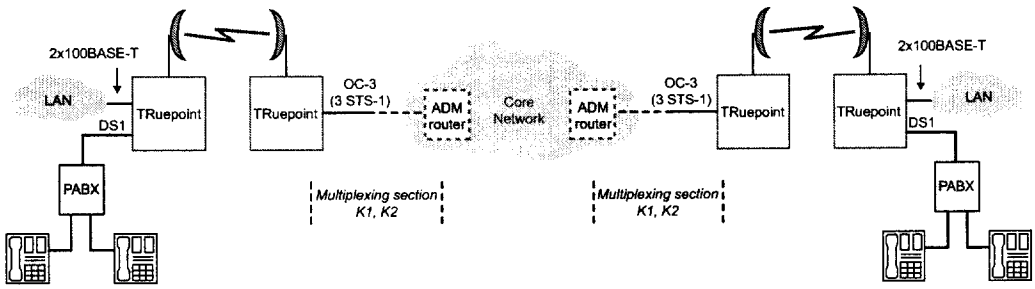
Unless otherwise indicated, typical performance

Typical Receiver Threshold dBm (BER 10^{-6})
With the 5100 RFU (13 to 23 GHz), values are enhanced by .5 dB.

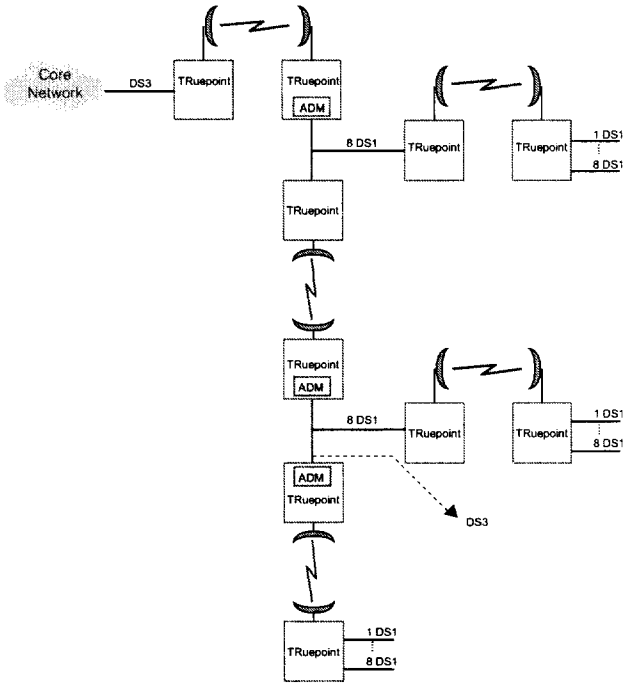
Typical Output Power dBm (802.11g)

Applications

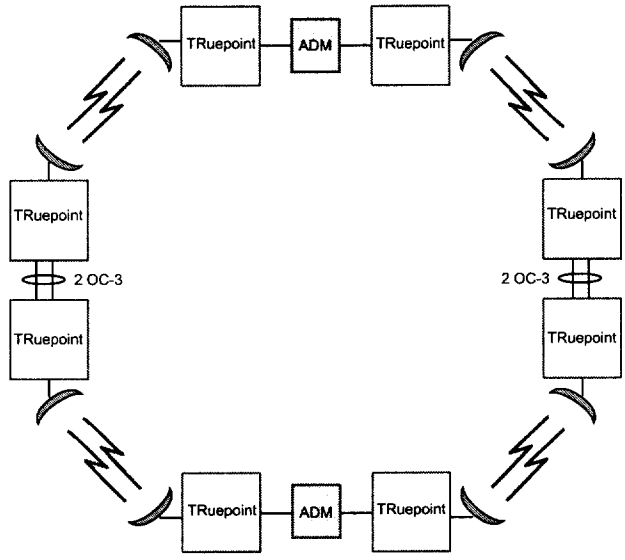
0-16 DS1 + 2 x 100BASE-T (4-100 DS1 equivalent airlink capacity)



Linear Spur DS3 with 8 DS1 ADM (Terminal Add/Drop Mux)



2 OC-3 Ring Protected System



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SPECIFICATION SHEET

PTP 49600

Motorola 4.9 GHz Point-to-Point Bridges

Motorola 4.9 GHz Point-to-Point Bridges – PTP 49600

Radio Technology	**Remarks**
RF band	4.940 GHz to 4.990 GHz*
Channel size	Configurable to 5, 10 or 20 MHz
Channel selection	By *intelligent* Dynamic Frequency Selection (i-DFS) or manual intervention; automatic selection on start-up and continual adaptation to avoid interference
Transmit power	Varies with modulation mode and settings from 0 to 23 dBm
System gain	Integrated: Varies with modulation mode; up to 165 dB using 22 dBi integrated antenna** Connectorized: Varies with modulation mode and antenna type**
Receiver sensitivity	Adaptive; varying between -95 and -59 dBm
Modulation	Dynamic, adapting between BPSK and 256 QAM
Error correction	FEC
Duplex scheme	Time Division Duplex (TDD) and Half Duplex Frequency Division Duplex (HD-FDD), Dynamic or Fixed ratio; each TDD-enabled link requires a Memorylink UltraSync™ GPS-100M synchronization unit to provide the PTP 49600 with an accurate timing reference signal
Antenna	Integrated: Integrated flat plate 22 dBi, 20 degree beam width Connectorized: Can operate with a selection of separately-purchased single and dual polar antennas through 2 x N-type female connectors (local regulations should be checked prior to purchase)
Range	Up to 124 miles (200 km)***
Security and encryption	Proprietary scrambling mechanism; optional FIPS-197 compliant 128/256-bit AES Encryption

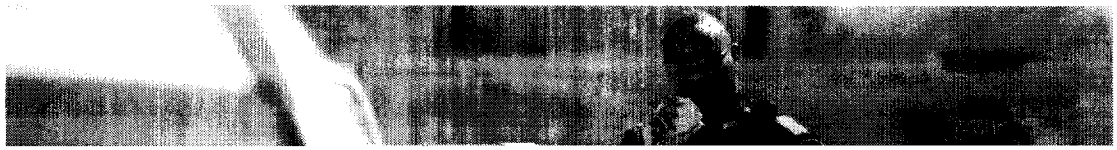
* Regulatory conditions for RF bands should be confirmed prior to system purchase

** Gain, maximum transmit power and effective radiated power may vary based on regulatory domain

*** In all cases the range limit is set by the latest software release

Ethernet Bridging & T1/E1	
Protocol	IEEE 802.3
User data throughput	Dynamically variable up to 125 Mbps at the Ethernet (aggregate): 5 MHz Channel: Up to 41 Mbps 10 MHz Channel: Up to 84 Mbps 20 MHz Channel: Up to 125 Mbps
Latency one way	<2 ms typical with 20 MHz channel <3 ms typical with 10 MHz channel <5 ms typical with 5 MHz channel
Packet prioritization	IEEE 802.1p, single priority level
Ethernet interface	10 / 100 / 1000 Base T (RJ-45), auto MDI/MDIX, optional 1000 Base SX
T1/E1 interface	ITU-T G.703/G.704 G.823/G.824

DATA SHEET



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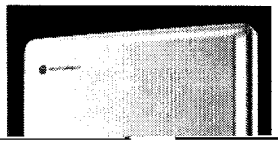
Charles Margutta Sales Manager

Print Name & Title

DATA SHEET

MOTOROLA PTP 49600 BRIDGE



Around Trees and Buildings, Over Hills and Water
PTP 49600 bridges deliver secure, high-capacity, super-reliable connectivity in virtually any environment – over non-line-of-sight and long-distance line-of-sight paths, over water and open terrain, even in extreme

- Advanced Spectrum Management with *i*-DFS – self-selects the frequency over which the bridge can sustain the highest data rate at the highest availability
- Best-in-Class Radios – offer the highest system

Path Length Calculation

SYSTEM NAME	Long Beach Fire Department
SYSTEM LOCATION	Training Center
NODAL SITE NAME	Signal Hill City of Long Beach
USER SITE NAME	Radio Site

NODAL LATTITUDE	33	D	47	M	54	S	33.7983	DEGREES
NODAL LONGITUDE	118	D	8	M	11	S	118.1365	DEGREES
NODAL ELEVATION, AMSL	23	FEET					7	METERS
NODAL ANTENNA HEIGHT, A	30	FEET					9	METERS
USER LATTITUDE	33	D	47	M	58	S	33.7994	DEGREES
USER LONGITUDE	118	D	9	M	47	S	118.1629	DEGREES
USER ELEVATION, AMSL	354	FEET					108	METERS
USER ANTENNA HEIGHT, AGI	165	FEET					50	METERS

PATH LENGTH	1.52 MILES	2.44 KILOMETERS

	NODE TO USER	USER TO NODE
ELEVATION SLOPE	3.3 DEGREES	-3.3 DEGREES

MICROWAVE LINK BUDGET

	ENTER	
Frequency	11	GHz
	ENTER	
Distance	1.52	Miles
Path loss	**121.1**	dB

REFERENCE CHART A.		
	2 GHz	6 GHz
Antenna	**Gain**	**Gain**
2ft dish	24	29
4ft dish	27	35.2
6ft dish	31	38.9
8ft dish	33.5	41.5

Enter typical climate and terrain here

		REFERENCE CHART B.	Climate	Terrain
Climate	0.1	Average	0.25	1.00
Terrain	0.25	Mountain,dry	0.1	0.25
		Smooth, Humid	0.5	4.00

Transmitter Power	19	dBm (typical)	
Transmission Line	175	ft	1.3 dB - Loss/100 ft (see Chart C.)
Tx Antenna Gain	35	dB See Chart A.	
Rx Antenna Gain	35	dB See Chart A.	
Transmission Line	60	ft	1.3 dB - Loss/100 ft (see Chart C.)
Receiver Threshold	70	dBm (minus)	
RSL	-35.1		
Fade Margin (25 dbi)	34.9	dB	
Availability	**100.000000%**		
Outage Time	0.00	min/year	

REFERENCE CHART C.		
TX feeder line loss: dB/100 ft.		
Heliax (foam)	2 GHz	6 GHz
1/2	3.8	6.6
5/8	2.5	4.8
7/8	2.2	xxxx
1 1/4	1.6	xxxx
1 5/8	1.4	xxxx
Waveguide	xxxx	1.3

REFERENCE CHART D. - FYI

This is a separate calculator for comparing availability vs outage time
Enter your target availability, outage time will then be calculated.

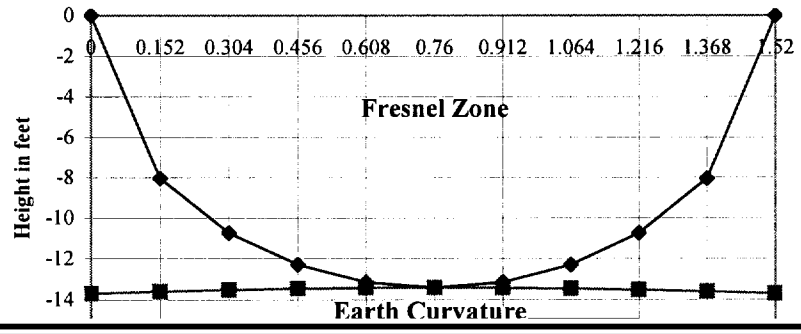
	ENTER	
Availability	99.99999	%
Outage Time	**0.05**	min/year

MICROWAVE PATH CLEARANCE

	ENTER			
Frequency	11	GHz		
	ENTER			**Earth Curvature**
Distance	1.52	Miles		

			Distance from Link end (miles)	K factor **1.33**	
	0		0	0	ft
Fresnel Zone	8	ft	0.152	0	ft
	11	ft	0.304	0	ft
	12	ft	0.456	0	ft
	13	ft	0.608	0	ft
Mid Point	**13**	ft	**0.76**	**0**	ft
	13	ft	0.912	0	ft
	12	ft	1.064	0	ft
	11	ft	1.216	0	ft
	8	ft	1.368	0	ft
	0		1.52	0	ft

Total Clearance Required = 1.0 x Fresnel Zone when k= 1.33



Path Length Calculation

SYSTEM NAME	**Downey Fire Department**
SYSTEM LOCATION	**Training Center**
NODAL SITE NAME	**Signal Hill City of Long Beach**
USER SITE NAME	**Radio Site**

NODAL LATTITUDE	33	D	55	M	46	S	33.9295	DEGREES
NODAL LONGITUDE	118	D	8	M	50	S	118.1473	DEGREES
NODAL ELEVATION, AMSL	109	FEET					33	METERS
NODAL ANTENNA HEIGHT, A	52	FEET					16	METERS
USER LATTITUDE	33	D	47	M	58	S	33.7994	DEGREES
USER LONGITUDE	118	D	9	M	47	S	118.1629	DEGREES
USER ELEVATION, AMSL	354	FEET					108	METERS
USER ANTENNA HEIGHT, AGI	165	FEET					50	METERS

PATH LENGTH	9.01	MILES	14.50	KILOMETERS

	NODE TO USER		USER TO NODE	
ELEVATION SLOPE	0.4	DEGREES	-0.4	DEGREES

MICROWAVE LINK BUDGET

	ENTER	
Frequency	11	GHz
Distance	9.01	Miles
Path loss	**136.5**	dB

REFERENCE CHART A.		
	2 GHz	6 GHz
Antenna	**Gain**	**Gain**
2ft dish	24	29
4ft dish	27	35.2
6ft dish	31	38.9
8ft dish	33.5	41.5

Enter typical climate and terrain here

		REFERENCE CHART B.	Climate	Terrain
Climate	0.1	Average	0.25	1.00
Terrain	0.25	Mountain,dry	0.1	0.25
		Smooth, Humid	0.5	4.00

Transmitter Power	19	dBm (typical)	
Transmission Line	175	ft	1.3 dB - Loss/100 ft (see Chart C.)
Tx Antenna Gain	40	dB See Chart A.	
Rx Antenna Gain	40	dB See Chart A.	
Transmission Line	50	ft	1.3 dB - Loss/100 ft (see Chart C.)
Receiver Threshold	70	dBm (minus)	
RSL	-40.4		
Fade Margin (25 dbi)	29.6	dB	
Availability	**99.999944%**		
Outage Time	0.29	min/year	

REFERENCE CHART C.		
TX feeder line loss: dB/100 ft.		
Heliax (foam)	2 GHz	6 GHz
1/2	3.8	6.6
5/8	2.5	4.8
7/8	2.2	xxxx
1 1/4	1.6	xxxx
1 5/8	1.4	xxxx
Waveguide	xxxx	1.3

REFERENCE CHART D. - FYI

This is a separate calculator for comparing availability vs outage time
Enter your target availability, outage time will then be calculated.

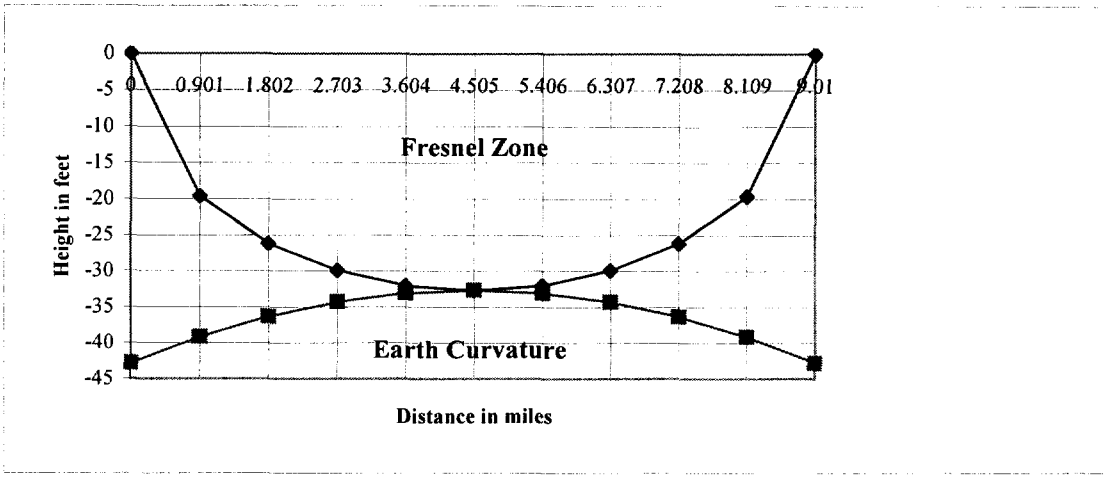
	ENTER	
Availability	99.99994	%
Outage Time	**0.29**	min/year

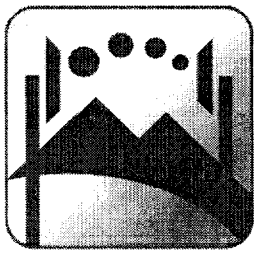
MICROWAVE PATH CLEARANCE

	ENTER			Earth Curvature
Frequency	11	GHz		
	ENTER			
Distance	9.01	Miles		

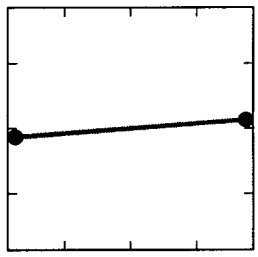
			Distance from Link end (miles)	K factor 1.33	
	0		0	0	ft
Fresnel Zone	20	ft	0.901	4	ft
	26	ft	1.802	6	ft
	30	ft	2.703	9	ft
	32	ft	3.604	10	ft
Mid Point	**33**	ft	**4.505**	**10**	ft
	32	ft	5.406	10	ft
	30	ft	6.307	9	ft
	26	ft	7.208	6	ft
	20	ft	8.109	4	ft
	0		9.01	0	ft

Total Clearance Required = 1.0 x Fresnel Zone when k= 1.33





Signal Hill to Vislink Services office



NOW, THEREFORE, if said Principal shall well and truly keep and faithfully perform all of the covenants, conditions, agreements and obligations of said contract on said Principal's part to be kept, done and performed, at the times and in the manner specified therein, then this obligation shall be null and void, otherwise it shall be and remain in full force and effect;

PROVIDED, that any modifications, alterations, or changes which may be made in said contract, or in the work to be done, or in the services to be rendered, or in any materials or articles to be furnished pursuant to said contract, or the giving by the City of any extension of time for the performance of said contract, or the giving of any other forbearance upon the part of either the City or the Principal to the other, shall not in any way release the Principal or the Surety, or either of them, or their respective heirs, administrators, executors, successors or assigns, from any liability arising hereunder, and notice to the Surety of any such modifications, alterations, changes, extensions or forbearances is hereby waived. No premature payment by said City to said Principal shall release or exonerate the Surety, unless the officer of said City ordering the payment shall have actual notice at the time the order is made that such payment is in fact premature, and then only to the extent that such payment shall result in actual loss to the Surety, but in no event in an amount more than the amount of such premature payment.

IN WITNESS WHEREOF, the above named Principal and Surety have executed, or caused to be executed, this instrument with all of the formalities required by law on this 6th day of August, 2009.

Vislink Services

CONTRACTOR / PRINCIPAL

By: _____

Name: Robert Jordan

Title: General Manager

By: _____

Westchester Fire Insurance Company

SURETY

By: _____

Name: Christopher R. Kelly

Title: Attorney-in-Fact

Telephone: 860-723-5762

Summary	
Link Name	Signal Hill to Vislink Services office
Customer Company Name	Vislink test for City of Long Beach Fire department
Link Type	Line-of-Sight
Link Distance	17.552 miles
User IP Throughput Expectation Aggregate	Aggregate 144.53 Mbps assuming PTP-600 Series running the 600-08-02 software
RF Frequency Band	4.9 GHz (4900 to 4990 MHz)
RF Channel Bandwidth	20 MHz
License	USA, Canada
Description	Motorola PTP49600 20 MHz

Link IP Throughput & Availability	
Mean IP Throughput Required	70.00 Mbps
Mean IP Throughput Predicted	72.27 Mbps
Percentage of Required IP Throughput	103.24 %
Link Symmetry	Symmetric
Link Availability	99.9997 %

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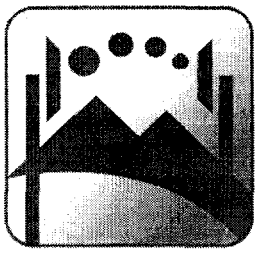
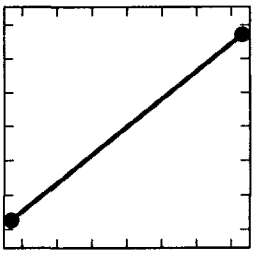
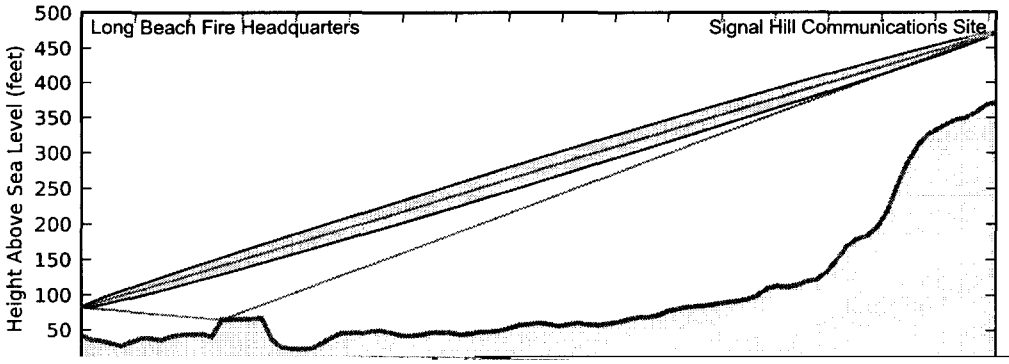


Long Beach Fire Headquarters to Signal Hill Communications Site



Equipment: Motorola PTP49600 Connectorised

Radio Waves 3ft Dual-Polar Parabolic SPD3-4.7NS Radio Waves 3ft Dual-Polar Parabolic SPD3-4.7NS



Summary	
Link Name	Long Beach Fire Headquarters to Signal Hill Communications Site
Customer Company Name	City of Long Beach Fire
Link Type	Line-of-Sight
Link Distance	1.714 miles
User IP Throughput Expectation Aggregate	Aggregate 150.17 Mbps assuming PTP-600 Series running the 600-08-02 software
RF Frequency Band	4.9 GHz (4900 to 4990 MHz)
License	USA, Canada
RF Channel Bandwidth	20 MHz

Link IP Throughput & Availability	
Mean IP Throughput Required	70.00 Mbps
Mean IP Throughput Predicted	75.08 Mbps
Percentage of Required IP Throughput	107.26 %
Link Symmetry	Symmetric
Link Availability	99.9999 %

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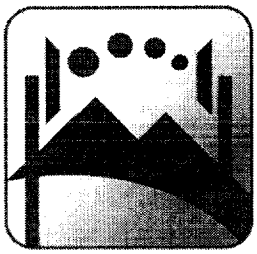
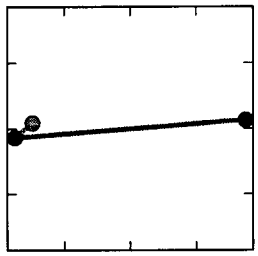
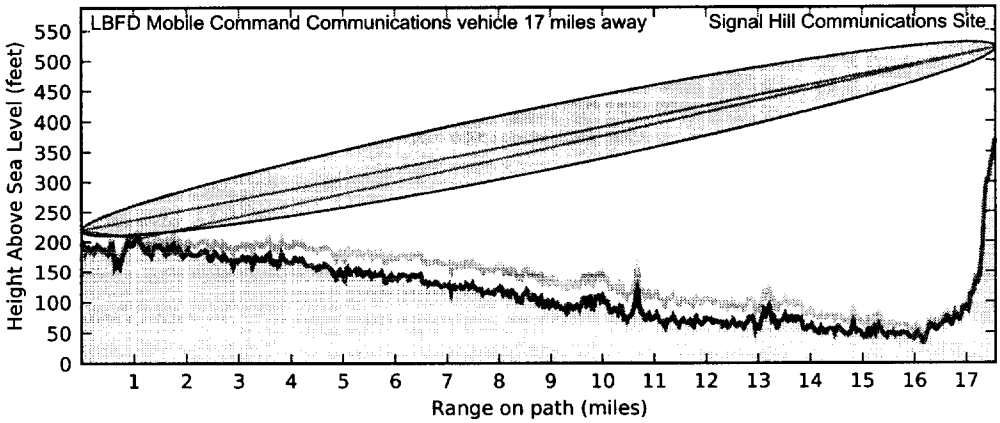


LBFD Mobile Command Communications vehicle 17 miles away to Signal Hill Communications Site



Equipment: Motorola PTP49600 Connectorised

Radio Waves 2ft Dual-Polar Parabolic SPD2-4.7NS Radio Waves 3ft Dual-Polar Parabolic SPD3-4.7NS



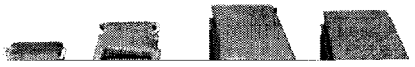
	Throughput to LBFD Mobile Command Communications vehicle 17 miles away	Throughput to Signal Hill Communications Site
Mean IP Predicted	72.3 Mbps	72.3 Mbps
Mean IP Required	70.0 Mbps	70.0 Mbps
Min IP Required	20.0 Mbps	20.0 Mbps
Min IP Availability Predicted	99.9961 %	99.9975 %
Min IP Availability Required	99.9900 %	99.9900 %

RPS™
RPS POWER SYSTEMS
AN ULTRALIFE COMPANY

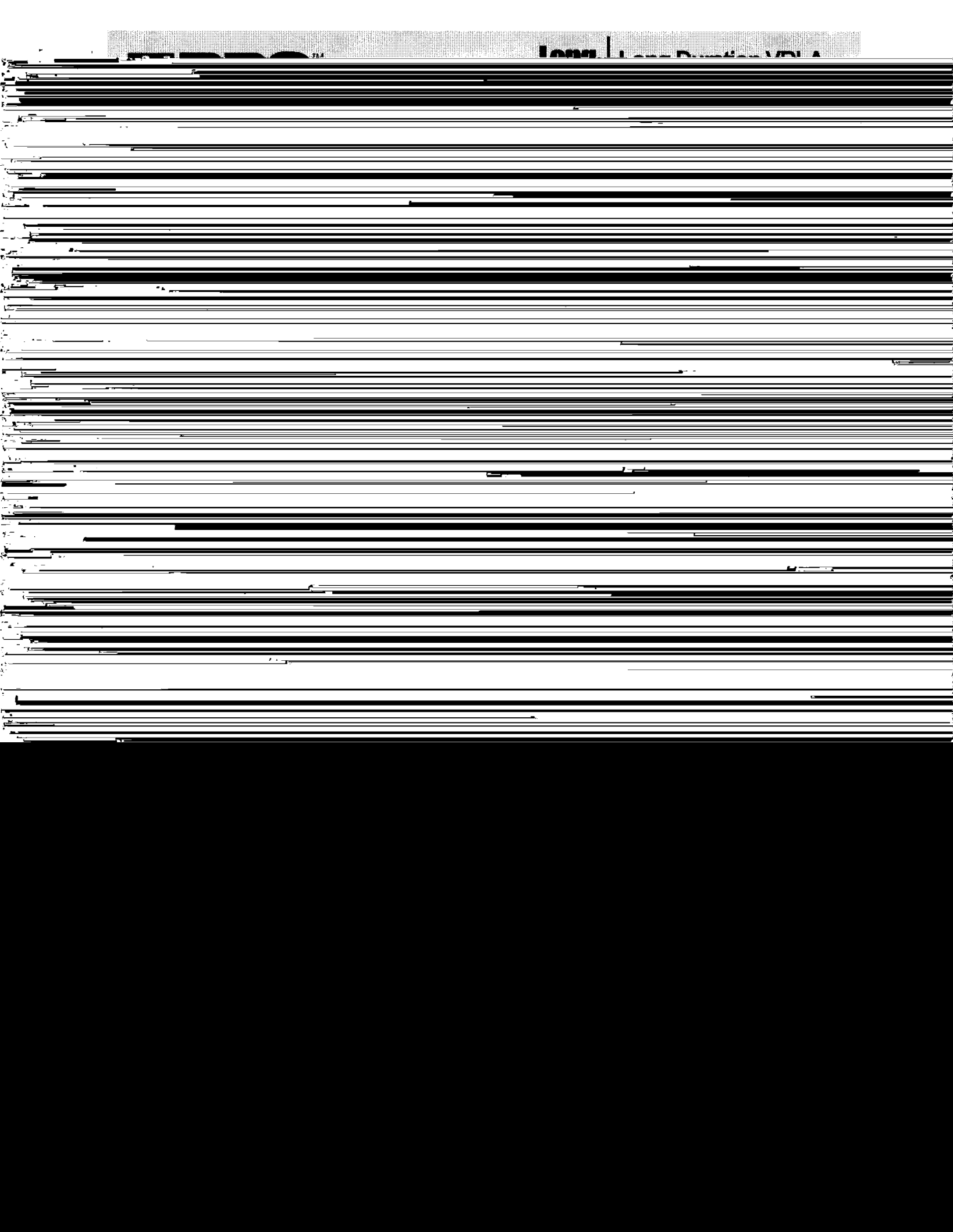
Long Duration Telecom

Long Duration VRLA

LDT-Series 7.2 – 200Ah



The **Long Duration Telecom (LDT-Series)** of Valve Regulated Lead Acid batteries feature the latest advancement in plate and battery technology offering exceptional service life, low self discharge, high cycling capabilities and low



It shall be possible to remotely retrieve the part number, serial number, manufacture

date and revision level, of each module in the radio. (Comply)

VISLINK SERVICES
526 W. Blueridge Ave, Orange, CA 92865
www.vislinkservices.com

Digital Interfaces: DS1 (110 ohms), DS3 (75 ohms), OC-3/STS-3 (OMM [optical multimode], OSM [optical single mode], 75 ohms), 10BASE-T, 100BASE-T

Frequency Source: All transceivers are tunable within the full frequency range of each transceiver

Frequency Stability: 6 to 38 GHz: ±5 ppm including aging

Auxiliary Channels:

Standard: Service Channel 1: 19.2 kbps asynchronous (RS-232)

Optional: Service Channels 2 and 3: Orderwire or Data Channel 64 kbps synchronous co- or contradirectional V.11 or G.703

Installation: SPU: indoors only; RFU: indoors or outdoors

Configurations:

TRuepoint 5100: 1+0, 1+1 (MHSB, SD), 2+0

TRuepoint 5200: 1+0, 1+1 (MHSB, FD, SD), 2+0, 3+0, 4+0, 2+2, 3+3, 4+4

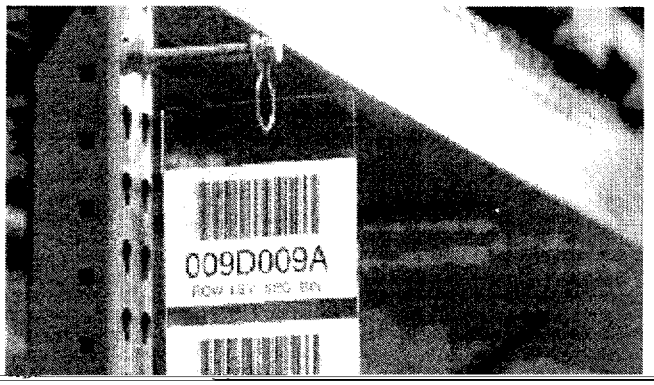
Network Management: NetBoss®, StarView™, FarScan™, SNMP Manager

Radio Control, Monitoring, and Maintenance Tools: Web-CIT, VT-100, Harris Stratex Networks handheld terminal, NMS, PCR

Alarms: Programmable relay alarms, 4 basic relays, 2 inputs (controller)

Optional: 12 relays/12 inputs or 6 relays/30 inputs, or a combination using two Relay & Alarm modules

Sloped Roof Mount for Panel Antenna



Sloped Roof Mounts support a single wireless panel antenna on roofs with slopes of 0°–45°.

The mast is adjustable, to enable a plumb installation regardless of the exact roof slope, and may be tilted back to the roof surface to facilitate antenna installation and maintenance. Hardware is included for mounting to roofs

FD09-041 Questions and Answers 6-26-09

1. Will there be a bid walk?

No

2. Although the bid spells out an all indoor requirement, can a split mount solution, combination of indoor and outdoor equipment, be proposed and still be responsive? If not, does the vendor also have to propose dehydration equipment?

All indoor equipment is required at Fire Training, Signal Hill, and Downey. The vendor as required by the system design will furnish dehydration equipment, except at the Signal Hill site. The Signal Hill site has dehydration equipment in place. The link from Signal Hill to Fire Headquarters and the link from the MCC to Signal Hill can be split mounted.

3. The paths are relatively short. An 18 GHz solution would provide the mandated availability. It also has smaller antenna requirements. Is this an acceptable approach?

No. The link from Signal Hill to Downey is 9 miles and will fade due to rain; and the required OC3 (100 t1) bandwidth is not available at 18GHz. The length of the link to the MCC is unknown, but could be as much as 12 miles. The Link from Fire Training to Signal Hill is 1.5 miles and would work at 18GHz except for the OC3 (100 t1) bandwidth requirement. The link from Signal Hill to Fire Headquarters is 1.9 miles and would work at 18GHz except for the OC3 (100 t1) bandwidth requirement.

4. Are you requesting a licensed microwave platform based upon an IP architecture with native t-1 circuit capability or are you seeking a platform based on the SONET architecture that handles 10/100BaseT packets encapsulated?

All links must be licensed and support clear channel t1 capability as well as IP. SONET is not desired.

5. Is the IP video going to run across the IP bandwidth (150-200 Mbps) or will the T-1's (DS-1's) carry the traffic?

The IP video will be carried by the IP bandwidth. The t1 bandwidth is for other traffic.

6. Why do you need 2.5 MHz, 3.75 MHz and 5.0 MHz channels if this is going to be mainly IP?

This is desired but not mandatory.

7. For the mobile command vehicle, will it always be deployed so that it has line-of-sight to Signal Hill?

Line of sight as conditions permit, non-line-of-sight operation is desired. High performance/quality 4.9 GHz radios with good specifications for the application are requested.

If not, must the vendors propose non-line-of-sight radios or will there be other repeater sites that can be utilized?

Non–line-of-sight operation is preferred. There are no additional repeater sites planned.

8. What is the timeframe for having this network operational?

Chris will answer this one but do you know what is a reasonable time to expect delivery of the radios? (As soon as the purchasing process can be completed and the equipment installed)

9. The basic payload for the microwave is two 10/100 connection and sixteen T-1's. It would appear that an OC3 based radio could not meet that requirement. A 300 Mbps system would be the only approach that provides the needed bandwidth. Correct?

OC3 bandwidth is correct; the bandwidth will be allocated to each output as needed. The microwave equipment must have the ability to allocate the bandwidth to each of the IP ports and the 16 possible t1 ports as needed.

10. How does the currently mobile command vehicle align itself? and to where?

Currently it is aligned manually (Quickset controller) by trial and error. We are requesting an automatic system using 4.9GHz radios that connect line / non-line-of-sight to a Signal Hill central receive site. The MCC will not move once it acquires the signal.

11. Most modern microwave radios use web-based connections through laptop computers. The VT-100 approach is rather antiquated. Is a laptop connection acceptable?

14. Are the Eltek battery systems described in Exhibit #3 to 5 already present at the facilities or is it up to the bidder to supply these equipments?

The bidder must supply the equipment for Fire training, Downey, and Fire headquarters. The Signal Hill site has a power system in place; the bidder to furnish a suitable DC circuit breaker and wiring.

15. Is there existing rack space available for radio and battery racks inside the equipment room?

There is no existing rack space at Fire Training, Downey, or Fire Headquarters. Rack space will be provided at the Signal Hill site.

16. Do you have an existing dehydrator unit? If not, should it be mounted on a wall or on a rack?

A dehydrator system is in place and available at the Signal Hill site. All other sites will require wall mounted dehydrator equipment.

17. Is there an available entry cable port for a waveguide at every site?

The Signal Hill site has cable tray, and entry ports. Entry ports must be provided at the other sites.

18. Can 3 to 4 foot dishes fit within the available tower spacing?

Yes.

19. The RFP calls for 11GHz links, where the 4.9GHz is being used only for the command vehicle. The last drawings show another 4.9GHz going to the fire HQ, is this correct?

It is desired to have the link to Fire Training operate on 4.9 GHz.

20. Is it possible to exclude in the bid the command vehicle 4.9GHz?

No.

21. Is there a need for a central network management system, or just a radio management SW?

The City currently utilizes Harris Corp. Starview, and Hp Openview (SNMP V2) for management of its microwave and other communications systems. It is highly desirable to have any new equipment be compatible with these management systems.

22. The requested radio capacity is minimum of 155MB, however there is multiple references to lower capacity i.e. 4/8… DS1's. What will be the licensed channel bandwidth? Are the requirements to allocate number of DS1's and Ethernet as needed? Or to support total capacity in the radio of 4DS1 etc…

The links from Fire training to Signal Hill, and Signal Hill to Downey will be 155 MB with two Ethernet ports and up to 16 t1 ports and the ability to allocate the bandwidth as needed. Licensed bandwidth 30 MHz. The link to the MCC vehicle will require one Ethernet port and 4 to 8 t1 ports with the ability to allocate the bandwidth as needed. The link to Fire Headquaters is IP only.

23. In Exhibit #2 page 28 and Exhibit #5 page 1 the requested capacity on the link between LBFD and Signal Hill is 300MB. Please clarify if the frequency requirement for this link is 4.9Ghz or 11Ghz.

4.9GHz

24. Page 28 indicates the need for 4.9 Ghz microwave hardware and antennas. Please clarify if this is a typo or not?

4.9 GHz antenna and hardware is required for the link to Fire Headquarters.

25. The RFP seems to be written for two types of systems, one for a 2 hop 11GHz microwave system and another for a two hop 4.9GHz microwave system. If the vendor cannot provide a solution for one of these systems, can they still bid on the other? That is, if a vendor cannot provide a 4.9GHz microwave system, can they still respond with an offering for the 11GHz microwave system?

No, we are looking for a single vendor solution.

26. Section 3.1 states that Long Beach Fire Dept Training Center, Downey Training Center, Signal Hill, and Fire HQ equipment locations are ventilated but do not have HVAC. Vendor's

28. Section 3.1 states "The antenna is to be mounted on the roof of a single story building using a non-penetrating tripod to be provided." Can you please clarify if the tripod is to be provided by the vendor?

Yes, the vendor will provide the tripod and all required hardware.

29. In regards to the power systems, will the vendor need to provide and install the (2) new 240VAC circuits? Also, can the vendor assume that there is sufficient breaker space available on the Sub panel at each location?

The vendor will install the 2 new 240 VAC circuits and may assume there is sufficient breaker space.

30. Will the vendor provided power systems need to power anything in addition to the proposed microwave equipment? If so, can load requirements be provided so the power systems can be sized appropriately?

No additional equipment will be powered from the microwave power system. Please see exhibit numbers 3,4,5.

31. With the radios being installed indoors, will the vendors need to provide new dehydrators at all sites? Can the vendor also assume 120VAC circuits are available for the dehydrator?

The vendor as required by the system design will furnish dehydration equipment, except at the Signal Hill site. The Signal Hill site has dehydration equipment in place. The vendor should not assume a suitable outlet is available.

32. For Section 9.2 and the requirement to provide information on the number of hours of service, can the vendor provide an implementation schedule and detail all the tasks involved? The schedule would show all tasks in days and weeks, but that can be converted to hours. Will this be acceptable?

An implementation schedule will be acceptable.

33. Is there a specific requirement as to the number of hours the vendor can work per day and the number of days the vendor can work a week? Is a 6 day, 10 hour work week acceptable?

Generally, 0700-1700 hours and Monday through Friday will be the guidelines.

34. Are prevailing wages required for the contract?

I don't believe they are, although I am in the process of getting clarification.

35. Is there any preference to a certain manufacture of Microwave radios equipment for this RFP? If so which manufacture are you leaning to?

Yes, Harris for the 11 GHz and Motorola for the 4.9 GHz or equivalents.

36. What is the dollar allowed budget for this RFP?

Great question, but I don't think it is appropriate to disclose that information.

37. Is this project using Grant moneys?

Yes. The funding is available immediately

Attachment C

Statement of Non-collusion

The proposal is submitted as a firm and fixed request valid and open for 90 days from the submission deadline.

This proposal is genuine, and not sham or collusive, nor made in the interest or in behalf of any person not herein named; the proposer has not directly or indirectly induced or solicited any other proposer to put in a sham proposal and the proposer has not in any manner sought by collusion to secure for himself or herself an advantage over any other proposer.

In addition, this organization and its members are not now and will not in the future be engaged in any activity resulting in a conflict of interest, real or apparent, in the selection, award, or administration of a subcontract.

[redacted]

Single T1/E1 with 5 and 10 MHz channels; dual T1/E1 with 20 MHz channel

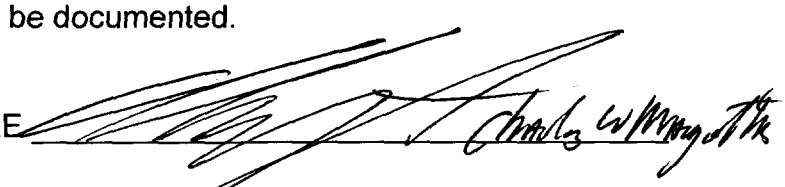
Management & Installation

LED indicators	Power status, Ethernet link status and activity

[redacted]

Attachment A
CERTIFICATION OF COMPLIANCE WITH TERMS AND CONDITIONS OF RFP

I have read, understand and agree to comply with the terms and conditions specified in this Request for Proposal. Any exceptions MUST be documented.

YES X NO _____ SIGNATURE 

EXCEPTIONS: Attach additional sheets if necessary. Please use this format.

EXCEPTION SUMMARY FORM

RFP SECTION NUMBER	RFP PAGE NUMBER	EXCEPTION (PROVIDE A DETAILED EXPLANATION)

ax:+1 714-998-7808

PROPOSAL

Department
rs
enue
90815

570-4980

Date	Proposal #
06/03/09	09CM0034-01

Sales Rep	Valid For
cmargiotta	90 Days

Payment Terms
50% Deposit with order

l Number FD09-041

	Unit Price	Ext. Price
	$40,797.65	$40,797.65

7/16/2009

Line	Qty	Description	Unit Price	Ext. Price
8		Sure-Shot IV antenna Tracking system contoller		
9		Custom mount system; > Custom bracket for PTP unit on 4A20 antenna		
10		Miscellaneous installation materials; > Nycoil, connectors and assocaited hardware		
11		Non-BAS general services / repairs; > Mobile Unit > Includes installation of 4.9GHz System		
12	1	Remote 4.9GHz Receive System including the following sub-assemblies;	$56,306.39	$56,306.39
13		4.5-5.2Ghz QP Ellipse antenna, Simultaneous Horizontal and Vertical polarities with mounting plate and RF cables to mount a Motorola PTP radio.		
14		Central Receive Antenna Control Cable Assembly, 250 ft length, with terminated top and bottom connectors		
15		Remote Site/Local Controller > 3.5 inch (2U) rack mount > Front switch panel for local operation with 160 character display > 8 (10 bit) analog input channels > Includes RS232/422, TCP/IP, Dial-up communications mediums > Requires PTI board > Includes TouchStar Lite Software		
16		Antenna Pan/Tilt Interface board. Customer to specify antenna manufacturer and model number > Includes Aux > Includes 10 Presets		
17		Antenna passive surge suppresser box with (10 ft) cable > ProScan, MicroScan, Ellipse, UltraScan		
18		Custom mount system; > Custom bracket for PTP unit on 4A20 antenna		
19		TouchStar-PRO Software Package > Requires Windows 2000/XP platform > TouchStar-PRO Software for one Master Controller	$3,325.00	$3,325.00
20		Map ConTroll Software for TouchStar 2008 > Provides a street map operator interface of receive site locations > Allows drag-and-drop alignment control of receive antenna > Provides database of shots logged including; - Transmitter location - Receive site used - Channel and polarity selected - Receive carrier level achieved		
21		Miscellaneous installation materials; > PC Controller and associated installation materials		

Description	Unit Price	Ext. Price
eral services / repairs;		
able DP tx/rx antenna system on top of Signal Hill tower, includes installation of radios, cables and control system		
enna control system at Long Beach facility.		
rify system operation		
Hz (PTP496000) radio system	$13,595.63	$13,595.63
.9 GHz, UP TO 120 MBPS, ETHERNET LICENSED, POINT - POINT RADIO, PTP49600 CONNECT		
) microwave system, Signal Hill to Fire HQ	$34,395.63	$34,395.63
.9 GHz, UP TO 120 MBPS, ETHERNET LICENSED, POINT - POINT RADIO, PTP49600 CONNECT		
.85 GHZ, 34.9 DBI GAIN, PARABOLIC DISH, N(F), DUAL		
s installation materials;		
bles and associated installation hardware		
general services / repairs;		
system between Signal Hill and Long Beach location		
Point 11GHz MW System, & Signal Hill	$141,803.31	$141,803.31
uepoint digital radios (RFU), 11GHz Monitored Hot Standby (1+1) indoor rack mount -48VDC		
/100 base T 16 DS1 mux		
U Coax cable, 5 ft		
r Cables, 6 ft		
l Keypad		
on Manuals, 3 Volume Set (RFU, SPU & Operators interface)		
on Manuals, CD-ROM		
Accessories 7' , 19" Aluminum Equipment Rack		
e Panel, -48VDC One per rack		
e one per terminal		
e Handset (one per site)		

Line	Qty	Description	Unit Price	Ext. Price
42		(2) 6 ft. ultra high performance antenna for 10.7-11.7 GHz with dual pol. feed, CPR90G, Gray With White Teglar Radome, Flash, Global Standard Pack - 1 PC Reflector. Antennas may change due to frequency coordination and FCC rules and extra charges may apply to change of antenna requirements from FCC to optain FCC licenses .		
43		(300) Standard elliptical waveguide, EW90, (Wideband from 10.5 - 11.7 GHz) > 150' per antenna		
44		(2) Connector, fixed-tuned, mates with CPR90G for EW90		
45		Pressure window use with WR90 CPR flanges		
46		(2) Flexible Twist, WR90, CPR90G, Length: 36.0, CPR90G, 10.7 - 11.7 / VSWR: 1.0		
47		Dehydrator, Manual Regeneration, High Pressure .3 TO .5 PSI, 115V/50/60HZ, US Cord		
48		Non-BAS general services, Downy Tru-point system; > Install Harris Tru-point system, customer to supply antennas, radios, waveguide, connectors and associated installation hardware.		
49		(2) Frequency coordination services, customer shall be responsible for filling licensing with FCC. Per path charge		
50		Miscellaneous installation materials; > Waveguide hangers, entry ports, grounding kits, manifold, (2) antenna mounts and associated installation hardware		
51	1	Long Beach Fire Training TruPoint 11GHz MW	$143,103.31	$143,103.31
52		(2) Harris TRuepoint digital radios (RFU), 11GHz Monitored Hot Standby (1+1) indoor rack mount -48VDC		
53		(2) Base t 10/100 base T 16 DS1 mux		
54		(4) SPU to RFU Coax cable, 5 ft		
55		(4) DC Power Cables, 6 ft		
56		(2) Handheld Keypad		
57		(2) Installation Manuals, 3 Volume Set (RFU, SPU & Operators interface)		
58		(2) Installation Manuals, CD-ROM		
59		(2) Racks & Accessories 7' , 19" Aluminum Equipment Rack		
60		(2) Rack Fuse Panel, -48VDC One per rack		
61		(2) Orderwire one per terminal		
62		(2) Orderwire Handset (one per site)		

Line	Qty	Description	Unit Price	Ext. Price
63		(2) 6 ft. ultra high performance antenna for 10.7-11.7 GHz with dual pol. feed, CPR90G, Gray With White Teglar Radome, Flash, Global Standard Pack - 1 PC Reflector. Antennas may change due to frequency coordination and FCC rules and extra charges may apply to change of antenna requirements from FCC to optain FCC licenses .		
64		(300) Standard elliptical waveguide, EW90, (Wideband from 10.5 - 11.7 GHz) > 150' per antenna		
65		(2) Connector, fixed-tuned, mates with CPR90G for EW90		
66		Pressure window use with WR90 CPR flanges		
67		(2) Flexible Twist, WR90, CPR90G, Length: 36.0, CPR90G, 10.7 - 11.7 / VSWR: 1.0		
68		Dehydrator, Manual Regeneration, High Pressure .3 TO .5 PSI, 115V/50/60HZ, US Cord		
69		Non-BAS general services, Long Beach Fire training; > Install Harris Tru-point system, customer to supply antennas, radios, waveguide, connectors and assocaited installation hardware. Customer shall supply technician to install and set up radios.		
70		(2) Frequency coordination services, customer shall be responsible for filling licensing with FCC. Per path charge		
71		Valmont Roof Top Tripod Mount 4.5" OD mast size 8' height with roof pads	$1,300.00	$1,300.00
72		Miscellaneous installation materials; > Waveguide hangers, entry ports, grounding kits, manifold, (2) antenna mounts and associated installation hardware		
73	1	Flatpack Battery System; Downy, Long Beach Training	$24,636.30	$24,636.30
74		(3) 200A Flatpack FP3UD -48VDC including LVBD; 12 Load - 2 Battery Breaker Posisitons		
75		(6) Flatpack 1500 W 48V G2 Rectifiers		
76		(6) Blindpanel front Flatpack 1500@		
77		(3) Webpower Controller Kit 1U		
78		(3) Breaker 100A 1P Aux 5/16 Bullet - Battery Breaker		
79		(3) R-19-7-6 Relay rack 19"W x 7'H		
80		(3) Battery Tray Kit 19" Battery Tray		
81		(6) Breaker 20A 1P Aux 5/16 Bullet - Load Breakers		
82		(3) Battery Wire #1; 125A, #4 10 Ft; 1/4" lug		
83		(3) Enersys Battery - 12V115F; 12V/115AH Battery Set		

Line	Qty	Description	Unit Price	Ext. Price
84		(3) RPS Battery - 12V/125AH Battery Set - see attached literature		
85	1	Performance bond as per RFP > Performance bond is based on 50% of contract (tax and shipping excluded) at 3%	$6,900.00	$6,900.00
86				

Equipment Sub-total	$ 368,638.22
Tax // 9.25%	$ 34,099.05
Services Sub-total	$ 92,900.00
Freight Sub-total	$ 3,460.00
Grand Total	**$ 499,097.27**

Proposal Note(s) / Disclaimers:

Notes:
6' UHX antennas has been quoted based on preliminary path calculations. Larger antennas may be required proceeding FCC frequency coordination. In the event that larger antennas are required, change order will be required.

Long Beach Fire Department will be required to provide EVDO service for remote truck controller.

Sales Tax is 9.25% on all equipment in this proposal

Unless otherwise specified, this proposal is a "lump sum" proposal that is based on customer provided information. Integration charges and or service charges may be subject to increase proceeding site evaluation. Equipment and or material quantities may also be revised pending site evaluation. In the event that additional equipment and or materials are required and or if additional labor is required, Vislink Services shall submit a revised proposal for approval for the required additional charge(s).

Payment Terms:
A 50% deposit will be required upon contract acceptance. No equipment will be ordered prior to receipt of the deposit and or signed proposal / purchase order. Equipment balance will be invoiced upon customer (or customer agent) receipt of equipment and due net cash upon receipt of invoice. All services will be invoiced upon completion and due net cash upon receipt of invoice. In the event that the project is not 100% completed within a single 30 day billing cycle a percentage of completion invoice will be issued at the end of the cycle and due net cash upon receipt of invoice. In the event any invoice is not paid when due, Vislink Services has the right to stop work and keep the project idle until past due invoices are paid.

Deposit Amount Due with Order: $230,769.11

Excluded Services:

Unless otherwise specified in this proposal, structural engineering, architectural services and or permitting services are not included with this proposal. Vislink Services can provide these services at an additional cost above and beyond the original proposed amount.

Freight:

If provided, freight charges have been provided for budgetary purposes only. FOB shall be shipping point. Customer shall be invoiced for the actual amount of freight associated for the proposed equipment and or materials. Unless otherwise specified by the customer in writing, Vislink Services shall use the manufacturer(s) preferred carrier and shall allow the manufacturer(s) to insure any associated equipment and or materials. Freight charges shall be pre-paid and added to final invoice.

Taxes:
Customer shall be responsible for all associated sales taxes and or duties. In the event that sales taxes are not included with this proposal, customer shall still be responsible for the associated sales taxes and or duties. Sales tax shall be added to the final invoice.

Customer Modified Proposals:
No customer modified proposal shall be accepted by Vislink Services. In the event that the customer modifies Vislink Services proposal (quantity change, scope of work change, pricing, etc), a revised proposal shall be re-submitted to the customer for approval.

Proposal Acceptance:

I/We accept this proposal. Vislink Services is authorized to perform the work comprehended hereunder and I/we agree to pay the said amount with the terms set forth.

Signature: _____ **Date:** _____

Title: _____

Purchase Order No.: _____

Vislink Services

Charles Margiotta
Sales Manager

BID NO: _____

BOND NO: K07881848

BOND FOR FAITHFUL PERFORMANCE

KNOW ALL MEN BY THESE PRESENTS: That we, Vislink Services as PRINCIPAL, and Westchester Fire Insurance Company, located at 33 Arch Street, Boston, MA 02110, a corporation, incorporated under the laws of the State of New York, admitted as a surety in the State of California and authorized to transact business in the State of California, as SURETY, are held and firmly bound unto the **CITY OF LONG BEACH, CALIFORNIA**, a municipal corporation, in the sum of Two Hundred and Thirty Two Thousand 00/100----------DOLLARS ($ 232,000.00), lawful money of the United States of America, for the payment of which sum, well and truly to be made, we bind ourselves, our respective heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, said Principal has been awarded and is about to enter the annexed contract (incorporated herein by this reference) with said City of Long Beach for the Public Safety Microwave Network, and

[redacted]

Distance in miles

ACKNOWLEDGMENT

State of California
County of Orange)

On August 20, 2009 before me, A. Blakesley
(insert name and title of the officer)

personally appeared Robert W. Jordan and Daniel T. McIntyre,
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

A. [illegible]
Commission # 1806819
Notary Public - California
Orange County
My Comm. [illegible]

Signature A. Blakesley (Seal)

State of Connecticut }
}
County of Hartford }

On this 6th day of August, 2009 before me personally appeared

Christopher R. Kelly

To me know, who being by me duly sworn did depose and say the he is the Attorney-in-Fact of

Westchester Fire Insurance Company

The corporation described in and which executed the above instrument; that he Knows the seal of said corporation, and that he signed his named thereto by like Order.

Victoria P. Jovino
Notary Public
Hartford County
State of Connecticut

My Commission Expires: 2/28/2013

Power of Attorney

WESTCHESTER FIRE INSURANCE COMPANY

Know all men by these presents: That **WESTCHESTER FIRE INSURANCE COMPANY,** a corporation of the State of New York, having its principal office in the City of Atlanta, Georgia pursuant to the following Resolution, adopted by the Board of Directors of the said Company on December 11, 2006, to wit:

"RESOLVED, that the following authorizations relate to the execution, for and on behalf of the Company, of bonds, undertakings, recognizances, contracts and other written commitments of the Company entered into the ordinary course of business (each a "Written Commitment"):

(1) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise.

(2) Each duly appointed attorney-in-fact of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise, to the extent that such action is authorized by the grant of powers provided for in such persons written appointment as such attorney-in-fact.

(3) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized, for and on behalf of the Company, to appoint in writing any person the attorney-in-fact of the Company with full power and authority to execute, for and on behalf of the Company, under the seal of the Company or otherwise, such Written Commitments of the Company as may be specified in such written appointment, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments.

(4) Each of the Chairman, the President and Vice Presidents of the Company in hereby authorized, for and on behalf of the Company, to delegate in writing any other officer of the Company the authority to execute, for and on behalf of the Company, under the Company's seal or otherwise, such Written Commitments of the Company as are specified in such written delegation, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments.

(5) The signature of any officer or other person executing any Written Commitment or appointment or delegation pursuant to this Resolution, and the seal of the Company, may be affixed by facsimile on such Written Commitment or written appointment or delegation.

FURTHER RESOLVED, that the foregoing Resolution shall not be deemed to be an exclusive statement of the powers and authority of officers, employees and other persons to act for and on behalf of the Company, and such Resolution shall not limit or otherwise affect the exercise of any such power or authority otherwise validly granted or vested.

FURTHER RESOLVED, that the Resolution of the Board of Directors of the Company adopted at the meeting held on November 8, 1999 relating to the authorization of certain persons to execute, for and on

0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5 1.6 1.7

Range on path (miles)

	Throughput to Long Beach Fire Headquarters	Throughput to Signal Hill Communications Site
Mean IP Predicted	75.1 Mbps	75.1 Mbps
Mean IP Required	70.0 Mbps	70.0 Mbps
Min IP Required	20.0 Mbps	20.0 Mbps
Min IP Availability Predicted	99.9999 %	99.9999 %
Min IP Availability Required	99.9900 %	99.9900 %

Link Summary			
System Gain Margin	56.21dB	Total Path Loss	115.18dB
Free Space Path Loss	115.18dB	Mean Aggregate Data Rate	150.2Mbps
Excess Path Loss	0.00dB	Link Availability	99.999950 %

STATE OF CALIFORNIA

DEPARTMENT OF INSURANCE

SAN FRANCISCO

Certificate of Authority

THIS IS TO CERTIFY, *That, pursuant to the Insurance Code of the State of California,*

Westchester Fire Insurance Company

of New York, New York, organized under the laws of New York, subject to its Articles of Incorporation or other fundamental organizational documents, is hereby authorized to transact within this State, subject to all provisions of this Certificate, the following classes of insurance: ***Fire, Marine, Surety, Disability, Plate Glass, Liability, Workmen's Compensation, Common Carrier Liability, Boiler and Machinery, Burglary, Credit, Sprinkler, Team and Vehicle, Automobile, Aircraft, and Miscellaneous*** *as such classes are now or may hereafter be defined in the Insurance Laws of the State of California.*

THIS CERTIFICATE *is expressly conditioned upon the holder hereof now and hereafter being in full compliance with all, and not in violation of any, of the applicable laws and lawful requirements made under authority of the laws of the State of California as long as such laws or requirements are in effect and applicable, and as such laws and requirements now are, or may hereafter be changed or amended.*

WESTCHESTER FIRE INSURANCE COMPANY

FINANCIAL STATEMENT **DECEMBER 31, 2008**

ADMITTED ASSETS

BONDS	$	1,937,961,302
SHORT - TERM INVESTMENTS		25,152,122
STOCKS		119,791,289
REAL ESTATE		-
CASH ON HAND AND IN BANK		124,390,944
PREMIUM IN COURSE OF COLLECTION*		85,054,200
INTEREST ACCRUED		18,288,962
OTHER ASSETS		232,251,068
TOTAL ASSETS		$2,542,889,887

LIABILITIES

RESERVE FOR UNEARNED PREMIUMS	$	287,073,174
RESERVE FOR LOSSES		736,344,728
RESERVE FOR TAXES		6,120,207
FUNDS HELD UNDER REINSURANCE TREATIES		-
OTHER LIABILITIES		772,244,096
TOTAL LIABILITIES		1,801,782,205

CAPITAL: SPECIAL SURPLUS	89,536,923
CAPITAL: 928,592 SHARES, $4.85 PAR VALUE	4,503,671
CAPITAL: PAID IN	185,200,474
SURPLUS (UNASSIGNED)	480,293,890
SURPLUS TO POLICYHOLDERS	759,534,958
TOTAL	$2,561,317,163

(*EXCLUDES PREMIUM MORE THAN 90 DAYS DUE.)

STATE OF PENNSYLVANIA

COUNTY OF PHILADELPHIA

John P. Taylor, being duly sworn, says that he is Vice President of Westchester Fire Insurance Company and that to the best of his knowledge and belief the foregoing is a true and correct statement of the said Company's financial condition as of the 31 st day of December, 2008

Sworn before me this April 3, 2009

Vice President

Notary Public

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Irene T. Verratti, Notary Public
City Of Philadelphia, Philadelphia County
My Commission Expires Nov. 15, 2011
Member, Pennsylvania Association of Notaries

My commission expires