MOTOROLA, INC. CONTRACT

FOR

A

800 MHZ DIGITAL SMARTZONE SIMULCAST

PUBLIC SAFETY RADIO SYSTEM

COMMUNICATIONS SYSTEM AGREEMENT

COMMUNICATIONS SYSTEM AGREEMENT

Motorola, Inc., a Delaware corporation ("Motorola"), by and through the United States & Canada Group of its Commercial, Government, and Industrial Solutions Sector ("CGISS"), and the City of Miami Beach, a municipal corporation organized under the laws of the State of Florida ("Customer" or "City") enter into this Communications System Agreement (the "Agreement"), effective as of the last date signed below (the "Effective Date"), pursuant to which Customer will purchase and Motorola will provide Customer with a Communications System.

Section 1 EXHIBITS

The Exhibits below are hereby incorporated into and made a part of this Agreement. In interpreting this Agreement and resolving any ambiguities, the main body of this Agreement will take precedence over the Exhibits and any inconsistency between the Exhibits will be resolved in the order in which the Exhibits appear below.

Exhibit A Motorola Software License Agreement ("Software License Agreement")

Exhibit B Memoranda of Negotiation

Exhibit C Maintenance Terms & Conditions

Exhibit D Performance Schedule

Exhibit E Equipment List

Exhibit F Pricing Summary Attachment

Exhibit G Coverage Prediction

Exhibit H Acceptance Test Plans (Includes all ATPs)

Exhibit I Enhanced System Support Statement of Work and Software Subscription Agreement

Exhibit J Statement of Work and Addendums 1 & 2

Exhibit K Training

Section 2 DEFINITIONS

Capitalized terms used in this Agreement and not otherwise defined within the Agreement have the following meanings:

"**Acceptance Tests**" means those tests described in the Acceptance Test Plan.

"**Contract Price**" means the price for the System, and includes any taxes and all freight to Customer sites.

"**Communications System**" or "**System**" or "**Project**" is the communications system described in Exhibits E through J, including the Equipment and Software described in the System Description, Statement of Work, Acceptance Test Plan and Equipment List, Exhibit E.

"**Effective Date**" means that date upon which the last party to sign this Agreement has executed the Agreement.

"**Equipment**" is the equipment (and not Software) specified in the Equipment List included in Exhibit E.

"**Final Project Acceptance**" means all work has been completed, all existing Equipment has been removed from the site, and all punchlist items have been completed.

"**Infringement Claim**" means a claim that the Equipment manufactured by Motorola or the Motorola Software infringes a United States patent or copyright.

"**Motorola Software**" is software whose copyright is owned by Motorola.

"**Non-Motorola Software**" is software whose copyright is owned by a party other than Motorola.

"**Software**" includes Motorola and any Non-Motorola Software that may be furnished with the Communications System.

Section 3 SCOPE OF AGREEMENT

A. SCOPE OF WORK. Motorola will assemble and integrate the Equipment and Software, and deliver, install and test the Communications System at designated sites, as specified in accordance with this Agreement. Customer will perform its responsibilities as specified in accordance with this Agreement.

B. TERM. Unless otherwise terminated or extended in accordance with the provisions of this Agreement or extended by mutual agreement of the parties, the term of this Agreement shall begin on the Effective Date and shall continue until the date of System Acceptance or expiration of the Warranty Period as set forth in Section 9, whichever occurs last; except for Exhibits A, B, C, F, I and J, which terms shall be governed by the terms specified in each Exhibit.

C. CHANGE ORDERS. Changes in the quantity or character of the scope of work contemplated in this Agreement, including changes resulting in changes in the Contract Price or the time for performance, shall be authorized only by a written Change Order approved by Customer.

Motorola shall not be obligated to start work on any alteration requiring an increase in price or extension of time for completion until a Change Order setting forth the adjustment(s) has been approved by Customer. In the event satisfactory adjustment cannot be reached for any item requiring a Change Order, the parties may submit the matter to dispute for resolution as set forth in Section 14. During the pendency of the dispute resolution, Motorola shall proceed with the work set forth within the Change Order on a time and materials basis, which Motorola shall adequately document pending final resolution of such dispute(s).

D. ADDITIONAL PRODUCTS. For ten (10) years after the Effective Date of this Agreement, Customer may submit purchase orders for additional Motorola non-subscriber products manufactured by Motorola's CGISS which are currently available at the time of order. For seven (7) years after the Effective Date of this Agreement, Customer may purchase Motorola subscriber products as set forth in Memorandum of Negotiation #5 of this Agreement (Exhibit B). If Customer and Motorola have agreed to a convention for processing electronic data interchange ("EDI") transactions, purchase orders may be transmitted electronically. Each purchase order must specifically refer to this Agreement and will be an offer by Customer subject to Motorola's acceptance. Except for pricing and delivery terms, which must be stated on the purchase order, Customer and Motorola agree that the applicable terms of the main body of this Agreement will be the only terms and conditions that govern the purchase and sale of products identified on such purchase orders. Customer and Motorola agree that payment for all additional products so purchased will be due within forty–five (45) days after the date of Motorola's invoice for the products.

E. MAINTENANCE SERVICE. During the first year after System Acceptance, maintenance services and software support are provided pursuant to the terms of this Agreement, including the Software Subscription Agreement and ESS (Exhibit I), and Statement of Work (Exhibit J). Such services are included in the Contract Price. After the first year following System Acceptance, Customer may purchase maintenance services and software support for the fixed infrastructure equipment of the Communications System pursuant to a separately executed Maintenance Agreement and Software Subscription Agreement. Motorola will provide Customer with two additional years of Warranty subscribers at no additional cost to Customer per Section 9A of this Agreement. After the third year following System Acceptance Customer may purchase maintenance for subscribers pursuant to a separately executed Maintenance Agreement and Software Subscription Agreement.

F. MOTOROLA SOFTWARE. Any Motorola Software furnished will be licensed to Customer solely according to the terms and restrictions of the Software License Agreement attached as Exhibit A. Customer hereby accepts all of the terms and restrictions of the Software License Agreement.

G. NON-MOTOROLA SOFTWARE. Any Non-Motorola Software furnished by Motorola will be subject to the terms and restrictions of its copyright owner unless such copyright owner has granted to Motorola the right to sublicense such Non-Motorola Software, in which case the Software License Agreement (including any addendum to satisfy such copyright owner's requirements) shall apply.

H. SUBSTITUTIONS. At no additional cost to Customer, Motorola reserves the right to substitute any Equipment, Software, or services to be provided by Motorola, but only if the substitute meets the specifications and is of equivalent or better quality and value to the Customer. Any such substitution will be reflected in a Change Order.

Section 4 PERFORMANCE SCHEDULE

A. Motorola and Customer agree to perform their responsibilities in accordance with the Performance Schedule in Exhibit D.

B. By executing this Agreement, Customer authorizes Motorola to proceed with the manufacture, assembly, integration, delivery, installation, and testing of the Communications System after the parties' mutual acceptance of the Detailed Design Review. No further notice to proceed, purchase order, authorization, resolution, or any other action will be required.

Section 5 PAYMENT SCHEDULE

A. The total contract price is $4,850,000.00 ("Contract Price"). Except for the first payment, which is due when Customer executes this Agreement, Customer agrees to make payments to Motorola for work performed in accordance with this Agreement, within forty -five (45) days after the date of invoices that will be submitted by Motorola according to the following payment schedule:

- 5% of the contract value due upon contract execution;
- 10% of the contract value due upon mutual acceptance of Detailed Design Review;
- 35% of the contract value for preparation of the sites (to be paid out in proportion to the work done on at each site) for the sites as follows:

Fire Station 2 or alternate	9%
75th Street or alternate	9%
41st site	8%
Rebecca Towers	3%
Old City Hall	3%
New City Hall	3%

- 10% of the contract value due upon FNE shipment;
- 25% of the contract value due upon installation of all sites (to be paid out proportionately on a per site basis) for the sites as follows:

Fire Station 2 or alternate	7%
75th Street or alternate	6%
41st site	6%
Rebecca Towers	2%
Old City Hall	2%
New City Hall	2%

- 5% of the contract value due upon Ssystem cutover;
- 10% of the contract value due upon at Final Project Acceptance. Final Project Acceptance includes removal of all existing Equipment and resolution of punch list items.

B. The Customer is tax-exempt and will not pay or be charged freight costs.

C. Motorola's invoice(s) shall include a breakdown of the components of the work performed and the portion of work completed and the amount due, together with such supporting evidence as may be reasonably required by Customer.

D. Customer may withhold final payment or any progress payment to such extent as may be necessary on account of defective work not remedied by Motorola.

Section 6 INSTALLATION AND SITE CONDITIONS

A. In addition to its responsibilities described in the Statement of Work, Customer agrees to provide a designated project director; use best efforts to obtain any necessary City of Miami Beach approvals (including design and planning approvals); provide access to the sites identified in the Exhibits as requested by Motorola, and use best efforts to have such sites available for installation of the Equipment by Motorola in accordance with the Performance Schedule and Statement of Work.

B. If Customer determines during the course of performance of this Agreement that the sites identified in the Exhibits are no longer available or desired, or, if subsurface, structural, adverse environmental or latent conditions at any site differ from those indicated on the specifications in the Exhibits, Motorola and Customer will promptly investigate the conditions and jointly select replacement sites, as necessary and issue a written Change Order adjusting the installation plans and specifications.

C. If Customer and Motorola determine that any change in sites, site availability, installation plans, or specifications will require an adjustment in the Contract Price or in the time required for the performance of this Agreement, the parties will agree to subtract the total cost of the site to be eliminated and replace it with the cost of the site to be added. However, the Equipment used for any new site will be at the price of this Agreement and the price for the 75th Street replacement site will not exceed the proposed price for the 75th Street site. All replacement site costs will be available to the Customer or its agents for review prior to any payment by the Customer. In no event shall Motorola be required to disclosed confidential or proprietary cost or pricing data.

D. Customer will ensure that all existing work sites it provides will be safe, secure, and in compliance with all applicable industry and OSHA standards. To the extent applicable and unless the Statement of Work specifically states to the contrary, Customer will ensure that these work sites will have (i) adequate physical space for the installation, use and maintenance of the System; (ii) adequate air conditioning and other environmental conditions; (iii) adequate electrical power outlets, distribution and Equipment for the installation, use and maintenance of the System; and (iv) adequate telephone or other communication lines (except microwave circuits) for the installation, use and maintenance of the System, including modem access, and adequate interfacing networking capabilities. Before installing the Equipment at a work site, Motorola will inspect the work site and advise Customer in writing of any apparent deficiency or non-conformity with the requirements of this Section. Notwithstanding the preceding sentence, once Motorola has installed the Equipment in a particular work site, it shall be deemed to have accepted said work site. This Agreement is predicated upon normal soil conditions as defined by the version of E.I.A. standard RS-222 in effect on the Effective Date.

Section 7 TRAINING

If training is included in this Agreement, Customer agrees to notify Motorola immediately if a date change for a scheduled training program is required. A charge will apply to a training program rescheduled by Customer less than fourteen (14) days prior to its scheduled start date.

Section 8 SYSTEM ACCEPTANCE

A. The City will not intentionally use the Communications System prior to cutover. Motorola will test the Communications System in accordance with the Acceptance Test Plan. System Acceptance will occur upon the successful completion of such testing (i.e., after the system operates for 30 days without major failures, exclusive of minor punch list items) at which time both parties shall promptly execute a certificate of System Acceptance. Minor omissions or variances in performance, which do not materially affect the operation of the Communications System as a whole, will not postpone System Acceptance. Customer and Motorola will jointly prepare a list of such omissions and variances which Motorola will correct according to an agreed upon schedule. If the Acceptance Test Plan includes separate tests for individual subsystems, both parties shall promptly execute certificates of subsystem acceptance upon the successful completion of testing of such subsystems. Warranty of the Communications System will begin immediately upon System Acceptance.

B. Motorola agrees to notify Customer in writing when the Communications System is ready for acceptance testing. Motorola and Customer agree to commence acceptance testing within ten (10) business days after receiving such notification. Unless such testing is delayed for reasons beyond the control of Customer, in which case the parties agree to commence acceptance testing as soon as possible thereafter. Unless, testing is delayed for reasons beyond Customer's control, final payment will be due within forty-five (45) days after such notification from Motorola as provided herein, and the Warranty Period will commence immediately.

C. Motorola may, but is not obligated to, issue written authorization for Customer's use of the Communications System or its subsystem(s) for limited training or testing purposes, prior to the completion of testing by Motorola. Any intentional use of the Communications System without prior written authorization by Motorola shall constitute System Acceptance.

D. FINAL PROJECT ACCEPTANCE. Final Project Acceptance will occur after System Acceptance and when all deliverables and other work have been completed including removal of all existing Equipment and resolution of punch list items. When Final Project Acceptance occurs, the parties will promptly memorialize this final event by so indicating in the appropriate place on the System Acceptance Certificate. The acceptance of final payment shall constitute a waiver of all claims by Motorola, except those previously made in writing and identified by Motorola as unsettled at the time of the final application for payment.

Section 9 WARRANTY

A. WARRANTY PERIOD. Upon System Acceptance, the System Functionality representation described below is fulfilled. The Equipment and Motorola Software for the fixed infrastructure is warranted for a period of one (1) year after System Acceptance; subject to the warranties provided in the Memorandum of Negotiation #3 (Exhibit B). The subscribers are warranted for a period of three (3) years (i.e., initial warranty plus two additional years of warranty) following System Acceptance. All warranties shall be in accordance with the applicable limitations shown below. Customer must notify Motorola in writing if Equipment or Motorola Software does not conform to these warranties no later than one month after the expiration of the Warranty Period.

B. SYSTEM FUNCTIONALITY. Motorola represents that the Communications System will satisfy the functional requirements in the Exhibits. Upon System Acceptance this System Functionality representation is fulfilled. After System Acceptance, the Equipment Warranty set forth below, and the Software Warranty set forth in the Software License Agreement will apply. Motorola will not be responsible for performance deficiencies of the System caused by ancillary equipment not furnished by Motorola, without the prior written authorization of Motorola, attached to or used in connection with the System. Additionally, Motorola will not be responsible for System performance where the functionality is reduced for reasons beyond Motorola's control including but not limited to (i) an earthquake, adverse atmospheric conditions, or other natural causes; (ii) the construction of a building that adversely affects the microwave path reliability or radio frequency (RF) coverage; (iii) the addition of frequencies at System sites that cause RF interference or intermodulation; or (iv) Customer changes to load usage or configuration outside the specifications.

C. EQUIPMENT WARRANTY. Motorola warrants the Equipment against material defects in material and workmanship under normal use and service during the Warranty Period. Unless otherwise specified in writing, the Warranty Period for non-Motorola manufactured Equipment will be as stated in this Section.

At no additional charge and at its option, Motorola will either: repair the defective Equipment or replace it with the same or equivalent Equipment, and such action on the part of Motorola will be the full extent of Motorola's liability hereunder; provided that the System is functional as warranted; and provided further that the use of any "equivalent" Equipment shall first be approved in writing by Customer. Repaired or replaced Equipment is warranted for the balance of the original applicable Warranty period. All replaced parts of the Equipment shall become the property of Motorola.

Motorola warrants to Customer that Equipment as whole furnished under this Agreement will be new, and that all work will be of good quality and in conformance with the Agreement. All work not conforming to these requirements, including substitutions not approved and authorized in writing by Customer, may be considered defective. This warranty shall also extend to repaired or replaced Equipment.

THIS WARRANTY DOES NOT APPLY TO

a) Defects or damage resulting from use of the Equipment in other than its normal and customary manner.

b) Defects or damage occurring from misuse, accident, water, foreign liquids, acts of God or neglect.

c) Defects or damage occurring from testing, operation, maintenance, installation, alteration, modification, or adjustment not provided by Motorola, or in the case of non-Motorola supplied Equipment, not authorized by Motorola, pursuant to this Communications System Agreement.

d) Breakage or damage to antennas unless caused directly by defects in material or workmanship.

e) Equipment that has been subjected to unauthorized Equipment modifications, disassembly or repairs (including the addition to the Equipment of non-Motorola supplied Equipment if not authorized by Motorola) which adversely affect performance of the Equipment or interfere with Motorola's normal warranty inspection and testing of the Equipment to verify any warranty claim.

f) Equipment which has had the serial number removed or made illegible.

g) Batteries (because they carry their own separate limited warranty).

h) Equipment which, due to illegal or unauthorized alteration of the software in the Equipment, does not function in accordance with Motorola's published specifications or with the FCC type acceptance labeling in effect for the Equipment at the time the Equipment was initially distributed from Motorola.

i) Scratches or other cosmetic damage to Equipment surfaces that does not affect the operation of the Equipment.

j) Software (because it carries its own separate warranty).

k) Normal and customary wear and tear.

D. MOTOROLA SOFTWARE WARRANTY. Motorola Software is warranted in accordance with the terms of the Software License Agreement attached as Exhibit A.

E. These express limited warranties as set forth in this Section are extended by Motorola to the original end user purchasing or leasing the System for commercial, industrial, or governmental use only, and are not assignable or transferable. These are the complete warranties for the Equipment and Software provided pursuant to this Agreement.

F. THESE WARRANTIES ARE GIVEN IN LIEU OF ALL OTHER WARRANTIES. MOTOROLA DISCLAIMS ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT WILL MOTOROLA BE LIABLE FOR DAMAGES IN EXCESS OF THE PURCHASE PRICE OF THE EQUIPMENT. IN NO EVENT WILL MOTOROLA BE LIABLE FOR ANY LOSS OF USE, LOSS OF TIME, INCONVENIENCE, COMMERCIAL LOSS, LOST PROFITS OR SAVINGS OR OTHER INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE EQUIPMENT, TO THE FULL EXTENT SUCH MAY BE DISCLAIMED BY LAW.

Section 10 RESERVED.

Section 11 DELAYS

A. Successful Project implementation will require cooperation and fairness between the parties. Because it is impractical to provide for every contingency, which may arise during the course of performance of this Agreement, the parties agree to notify the other if they become aware that any condition will significantly delay performance. The parties will agree to reasonable extensions of the Project Schedule by executing a written Change Order.

B. Under no circumstances will either party be responsible for delays or lack of performance resulting from events beyond the reasonable control of that party ("Excusable Delays"). Excusable Delays include, but are not limited to: acts of God, weather conditions, compliance with laws and regulations (excluding Customer's failure to properly and timely apply for all required FCC licenses), governmental action, bid protests, fire, strikes, lock-outs, and other labor disruptions, material shortages, riots, acts of war, and an Excusable Delay of a Motorola subcontractor.

C. Customer will use its best efforts to make available to Motorola the sites as scheduled in Exhibit D, and Customer will not otherwise unreasonably delay or prevent Motorola's performance of its responsibilities when the sites are available. Customer agrees to give Motorola at least two weeks' notice if it delays Motorola's performance if a site is unavailable per Exhibit D, the Performance Schedule for more than thirty days (30), the Performance Schedule will be extended and, if requested by Motorola, compensate Motorola for all reasonable charges incurred because of such delay.

D. Prior to the mutual approval of the DDR, Motorola will be entitled to a day-for-day adjustment in the schedule due to a Customer delay. After mutual approval of the DDR, any claim for actual, demonstrated costs directly due to a Customer delay will be reduced to writing in a Change Order; said costs not to exceed $1000 per day for a cumulative maximum of thirty (30) days.

Section 12 DEFAULT

A. If Motorola fails to complete delivery, installation or acceptance testing in accordance with this Agreement, or otherwise breaches a material obligation under this Agreement, Customer may consider Motorola to be in default, unless such failure has been caused by an Excusable Delay. Customer agrees to give Motorola written notice of such default. Motorola will have thirty (30) business days from the receipt of such notice to provide a plan of action that is acceptable to Customer to cure the default. If Motorola provides a cure plan, it will begin implementing cure plan immediately after receipt of Customer's approval of the plan.

B. If Motorola fails to cure the default, Customer may terminate any unfulfilled portion of this Agreement. If Customer completes the Communications System through a third party, Customer may recover the reasonable costs of completing the Communications System to a capability not exceeding that specified in the Agreement for the terminated portion. Customer agrees to use its best efforts to

mitigate such costs. Motorola's liability under this Section is subject to the limitations of the Section entitled Limitation of Liability of this Agreement.

C. THE REMEDIES PROVIDED IN THIS SECTION OF THE AGREEMENT WILL BE THE FULL EXTENT OF MOTOROLA'S LIABILITY IN THE EVENT OF DEFAULT.

D. If Customer fails to pay any amount when due under this Agreement~~,~~; indicates that it is unable to pay any amount when due, or otherwise breaches a material obligation under this Agreement, Motorola may consider Customer to be in default, unless Motorola or an Excusable Delay causes such failure. If Motorola asserts a default, it will give Customer written and detailed notice of the default and Customer will have thirty (30) business days thereafter to (i) dispute the assertion, (ii) cure any monetary default, or (iii) provide a written plan to cure the default that is acceptable to Motorola. If Customer provides a cure plan, it will begin implementing the cure plan immediately after receipt of Motorola's approval of the plan. Motorola shall carry on the Project and adhere to the Performance Schedule during all disputes or disagreements with Customer. No work shall be delayed or postponed pending resolution of disputes or disagreements, EXCEPT in the event that Customer shall fail to pay Motorola pursuant to the Payment Schedule in Section 5, provided Motorola has submitted an invoice with proper documentation, and no monies are being withheld to remedy defective work. In that event, Motorola may, upon seven (7) business days prior written notice to Customer, stop work until payment is made.

Section 13 INDEMNIFICATION

A. Motorola shall indemnify and hold harmless Customer, its officers and employees, from liabilities, damages, losses and costs, including, but not limited to reasonable attorney's fees, to the extent caused by the negligence, recklessness or intentional wrongful misconduct of Motorola and persons employed or utilized by Motorola in the performance of this Agreement. These indemnifications shall survive the term of this Agreement. In the event that any action or proceeding is brought against Customer by reason of any such claim or demand, Motorola shall, upon written notice from Customer, resist and defend such action or proceeding by counsel.

The indemnification provided above shall obligate Motorola to defend at its own expense to and through appellate, supplemental or bankruptcy proceeding, or to provide for such defense, at Customer's option, any and all claims of liability and all suits and actions of every name and description covered herein that may be brought against Customer for action caused by Motorola or persons employed or utilized by Motorola.

B. PATENT AND COPYRIGHT INFRINGEMENT. Motorola will defend, at its own expense, any suit brought against the Customer to the extent that it is based on a claim that the Equipment or Motorola Software infringe a United States patent or copyright, and Motorola will pay those costs and damages finally awarded against the Customer in any such suit which are attributable to any such claim, but such defense and payments are conditioned on the following: i) Motorola must be notified promptly in writing by Customer of any notice of such claim; ii) Motorola will have sole control of the defense of such suit and all negotiations for its settlement or compromise; and iii) should a judgment for a claim be entered against Motorola for an infringement of a United States patent or copyright, Customer will permit Motorola, at its option and expense, either to procure for Customer the right to continue using the Equipment or Motorola Software or to replace or modify the same so that it becomes non-infringing.

Motorola will have no liability with respect to any claim of patent or copyright infringement which is (i) based upon the combination of the Equipment or Motorola Software furnished hereunder with software, apparatus or devices not furnished or otherwise authorized by Motorola, (ii) the use of ancillary equipment or software not furnished or authorized by Motorola which is attached to or used in connection with the Equipment or Motorola Software, (iii) any Equipment that is not Motorola's design or formula and that is not so authorized by Motorola, (iv) a modification, not authorized by Motorola, of the Motorola Software by a party other than Motorola, or (v) the failure by Customer to install an enhancement release to the Motorola Software that is intended to correct the claimed infringement. The foregoing states the entire liability of Motorola with respect to infringement of patents and copyrights by the Equipment and Motorola Software or any parts thereof.

C. Motorola's indemnification of Customer under this Section will be the full extent of Motorola's indemnification of Customer from liabilities that are in any way related to Motorola's performance under this Agreement.

Section 14 DISPUTES

A. Motorola and Customer will attempt to settle any claim or controversy arising from this Agreement through consultation and negotiation in good faith and a spirit of mutual cooperation. If those attempts fail, the dispute will be mediated by a mediator chosen jointly by Motorola and Customer within thirty days after notice by one of the parties demanding non-binding mediation. Mediation shall take place in Miami-Dade County. Any mediator used shall be certified in accordance with Florida law. Neither party may unreasonably withhold consent to the selection of a mediator, and Motorola and Customer will share the cost of the mediation equally. The parties may postpone mediation until they have completed some specified but limited discovery about the dispute. The parties may also replace mediation with some other form of non-binding alternate dispute resolution ("ADR") procedure. Pending final resolution of a claim, including mediation or any other form of ADR, unless otherwise agreed to in writing, Motorola shall proceed diligently with performance of the Agreement.

B. Any dispute that cannot be resolved between the parties through negotiation or mediation within two months after the date of the initial demand for non-binding mediation may then be submitted by either party to a court of competent jurisdiction in Miami-Dade County, Florida. Each party consents to jurisdiction over it by such a court. The use of any ADR procedures will not be considered under the doctrine of laches, waiver, or estoppel to affect adversely the rights of either party. Either party may resort to the judicial proceedings in Miami –Dade County, described in this paragraph prior to the expiration of the two-month period if (a) good faith efforts to attempt resolution of the dispute under these procedures have been unsuccessful or (b) interim relief from the court is necessary to prevent serious and irreparable injury to such party or any of its affiliates, agents, employees, customers, suppliers, or subcontractors.

C. WAIVER OF JURY TRIAL. This Agreement shall be interpreted and construed in accordance with and governed by the laws of the State of Florida. Any controversies or legal problems arising out of this Agreement and any action involving the enforcement or interpretation of any rights hereunder shall be submitted to the

jurisdiction of the State courts of the Eleventh Judicial Circuit of Miami-Dade County, Florida, the venue sites, and shall be governed by the laws of the State of Florida. By entering into this Agreement, Motorola and Customer hereby expressly waive any rights either party may have to a trial by jury of any civil litigation related to, or arising out of the Project.

Section 15 LIMITATION OF LIABILITY

Notwithstanding any other provision to this Agreement, except for personal injury or death, Motorola's or Customer's total liability, whether for breach of contract, warranty, negligence, strict liability in tort, indemnification, or otherwise, is limited to the direct damages recoverable under law, but not to exceed the Contract Price of the Equipment or services with respect to which losses or damages are claimed. IN NO EVENT WILL MOTOROLA OR CUSTOMER BE LIABLE FOR ANY LOSS OF USE, LOSS OF TIME, INCONVENIENCE, COMMERCIAL LOSS, LOST PROFITS OR SAVINGS, OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES RELATED TO OR ARISING FROM THIS AGREEMENT, THE SALE OR USE OF THE EQUIPMENT, OR THE PERFORMANCE OF SERVICES BY MOTOROLA TO THE FULL EXTENT THAT SUCH MAY BE DISCLAIMED BY LAW. This Limitation of Liability will survive the expiration or termination of this Agreement.

Nothing contained in this paragraph or elsewhere in this Agreement is in any way intended to be a waiver of the limitation placed upon the City's liability as set forth in Section 768.28, Florida Statutes.

Section 16 GENERAL

A. TITLE AND RISK OF LOSS. Title to the Equipment will pass to Customer upon shipment of the Equipment, except for damage in transit and title to Software will not pass to Customer at any time. Risk of loss will pass to Customer upon System Acceptance.

B. TAXES. The Contract Price does not include any amount for federal, state, or local excise, sales, lease, service, rental, use, property, occupation, or other taxes, all of which (other than federal, state, and local taxes based on Motorola's income or net worth) will be paid by Customer except as exempt by law. If Motorola is required to pay or bear the burden of any such taxes, Motorola will send an invoice to Customer and Customer will pay to Motorola the amount of such taxes (including any interest and penalties) within thirty days after the date of the invoice. Customer will be solely responsible for reporting the Equipment for personal property tax purposes.

C. CONFIDENTIAL INFORMATION. Customer will not disclose any material or information identified as Motorola proprietary and confidential to third parties without Motorola's prior written permission, unless Motorola makes such material or information public or disclosure is required by Florida law. If Customer is required by Florida law to disclose such material or information, Customer will notify Motorola prior to such disclosure.

D. DISCLAIMER OF LICENSE. Except as explicitly provided in the Motorola Software License Agreement included in Exhibit A, nothing in this Agreement will be deemed to grant, either directly or by implication, estoppel, or otherwise, any license or right under any patents, patent applications, copyrights, trade marks, trade secrets or other intellectual property of Motorola.

E. ASSIGNABILITY. This Agreement may not be assigned by either party without the prior consent of the other party except that Motorola may assign this Agreement to any of its affiliates, or its right to receive payment without the prior consent of Customer.

F WAIVER. Failure or delay by either party to exercise any right or power under this Agreement will not operate as a waiver of such right or power.

G. SEVERABILITY. If any portion of this Agreement is held to be invalid or unenforceable, that provision will be considered severable and the remainder of this Agreement will remain in full force and effect as if the invalid provision were not part of this Agreement.

H. HEADINGS AND SECTION REFERENCES. The headings given to the sections of this Agreement are inserted only for convenience and are not to be construed as part of this Agreement or as a limitation of the scope of the particular Section to which the heading refers.

I. ENTIRE AGREEMENT. This Agreement (including the Exhibits) constitutes the entire agreement of the parties regarding the subject matter of this Agreement and supersedes all previous agreements and understandings, whether written or oral, relating to such subject matter. This Agreement may be altered, amended, or modified only by a written instrument signed by the duly authorized representatives of both parties.

J. GOVERNING LAW. This Agreement will be governed by and construed in accordance with the laws of the State of Florida.

K. NOTICES. Notices authorized or required under this Agreement must be in writing and sent to the below addresses:

Customer:	City of Miami Beach	Motorola, Inc., Southern Division
Attn:	Director, Information Technology	Attn: Division Contract Manager
Address1	1100 Washington Ave.	789 International Parkway
City, St, Zip:	Miami Beach, FL 33139	Sunrise, FL 33325

COMMUNICATIONS SYSTEM AGREEMENT

In witness whereof, the parties have caused duly authorized representatives to execute this Agreement on the dates set forth below.

IN WITNESS WHEREOF:

Customer:	City of Miami Beach, FL	**Motorola, Inc.**	
By:		By:	
Name:		Name:	Robert C. Wartmann
Title:		Title:	MCEI Vice President, Sales
Date:		Date:	

APPROVED AS TO FORM & LANGUAGE & FOR EXECUTION

City Attorney RA 4/25/03 **Date**

MOTOROLA SOFTWARE LICENSE AGREEMENT - EXHIBIT A

This Software License Agreement is between Motorola, Inc., a Delaware corporation ("Motorola"), and the Licensee named below.

Section 1 SCOPE

Licensee may acquire from Motorola's Commercial, Government, and Industrial Solutions Sector ("CGISS") radio communication products ("Products") that contain embedded or pre-loaded Motorola software such as in a ROM, PROM, or EPROM, or other Motorola software provided on media such as a floppy disk, tape, diskette, or CD-ROM. All such software (including Radio Service Software and FLASHport® Software) is referred to as "Motorola Software." In addition, third party software may be included which Motorola does not own but is licensed to distribute. The terms of this Agreement apply to any such third party software unless an additional license agreement pertaining to the third party software is enclosed, in which case the terms of such license apply to said third party software. This Agreement contains the terms under which Licensee may use Motorola Software acquired from CGISS.

Section 2 GRANT OF LICENSE

Motorola hereby grants to Licensee a personal, non-exclusive license under Motorola's applicable proprietary rights to use Motorola Software in accordance with the terms of this Agreement.

Section 3 LIMITATIONS ON USE

Licensee may use Motorola Software only for Licensee's internal business purposes and only as described in the Motorola Software or Product documentation. Any other use of Motorola Software is strictly prohibited and will be deemed a breach of this Agreement. Licensee may not copy, modify, adapt, merge with other software, reverse engineer, prepare derivative works of, or disassemble any Motorola Software for any reason, except that Licensee may make at most two copies of Motorola Software provided with infrastructure equipment for back-up purposes. Licensee must purchase a copy of Radio Service Software for each site at which Licensee uses Radio Service Software; Licensee may make one additional copy for each computer owned or controlled by Licensee at each such site. Licensee may temporarily use Radio Service Software on portable or laptop computers at other sites. Prior to acquiring any Radio Service Software or upon Motorola's request, Licensee must provide a written list of all sites where Licensee uses or intends to use Radio Service Software. Licensee must reproduce all Motorola copyright and trademark notices on all copies of Motorola Software.

Section 4 TRANSFERS

If Licensee transfers ownership of Products to a third party, Licensee may assign its rights to use Motorola Software (other than Radio Service Software and FLASHport® Software) embedded in or furnished for use with those Products provided that (a) Licensee transfers all copies of such Motorola Software to the new owner and (b) Motorola receives a transfer form (which Motorola will provide

upon request) completed and signed by the new owner. Otherwise, Licensee may not transfer or make available any Motorola Software to any third party.

Section 5 OWNERSHIP AND TITLE

Title to all copies of Motorola Software in any form, including all rights in patents, copyrights, trade secrets, and other intellectual properties, remains vested exclusively in Motorola.

Section 6 CONFIDENTIALITY

Licensee acknowledges that all Motorola Software contains valuable proprietary information and trade secrets and that unauthorized dissemination, distribution, modification, reverse engineering, disassembly, or other improper use of Motorola Software will result in irreparable harm to Motorola for which monetary

damages would be inadequate. Accordingly, Licensee will limit access to Motorola Software to those of its employees and agents who need to use Motorola Software for Licensee's internal business purposes, and Licensee will take appropriate action with those employees and agents to preserve the confidentiality of Motorola Software.

Section 7 LIMITED WARRANTY

For the Warranty Period specified in the Communications System Agreement, Motorola warrants that the Motorola Software, when used properly, will be free from reproducible defects that eliminates the functionality of a feature critical to the primary functionality of a system. The primary functionality of a voice communication system is subscriber-to-subscriber, subscriber-to-dispatcher, and dispatcher-to- subscriber voice communication. The primary functionality of a data system is point-to-point data transmission. Motorola does not warrant that Licensee's use of the Motorola Software or the Products will be uninterrupted or error-free. Motorola warrants the Software and/or the Products will meet the terms of the Communications System Agreement. MOTOROLA'S TOTAL LIABILITY, AND LICENSEE'S SOLE REMEDY, FOR ANY BREACH OF THIS WARRANTY WILL BE LIMITED TO REPAIR OR REPLACEMENT OF THE MOTOROLA SOFTWARE OR PAYMENT OF LICENSEE'S DIRECT DAMAGES UP TO THE AMOUNT PAID TO MOTOROLA FOR THE MOTOROLA SOFTWARE OR THE INDIVIDUAL PRODUCT IN WHICH THE MOTOROLA SOFTWARE IS EMBEDDED OR FOR WHICH IT WAS PROVIDED. THIS WARRANTY EXTENDS ONLY TO THE FIRST LICENSEE; SUBSEQUENT TRANSFEREES MUST ACCEPT THE MOTOROLA SOFTWARE "AS IS" AND WITH NO WARRANTIES OF ANY KIND. MOTOROLA DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Section 8 LIMITATION OF LIABILITY

EXCEPT FOR PERSONAL INJURY OR DEATH, IN NO EVENT WILL MOTOROLA BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES UNDER THIS AGREEMENT.

Section 9 TERM AND TERMINATION

Licensee's right to use Motorola Software will begin when Licensee sends a duly executed copy of this Agreement to Motorola, and either (a) Motorola returns a fully executed Agreement to Licensee or (b) Motorola ships Motorola Software or a Product containing Motorola Software to Licensee, and will continue in perpetuity unless terminated as follows. Licensee's right to use Motorola Software will terminate without notice upon a breach of this Agreement by Licensee; provided, however, that Motorola will not physically disable or otherwise interfere with the use of any Motorola Software necessary to operate Licensee's Communication System, without giving notice of and twenty-four hours to cure the breach. In addition, if Licensee breaches this Agreement with respect to Radio Service Software or FLASHport® Software, Motorola may, by notice to Licensee, terminate Licensee's right to use such Motorola Software. Upon termination, Motorola will be entitled to seek immediate injunctive relief without proving damages and, unless Licensee is a sovereign government entity, Motorola will have the right to repossess all Radio Service Software and FLASHport® Software in Licensee's possession. Within thirty days after termination of Licensee's right to use any Motorola Software, Licensee must certify in writing to Motorola that all copies of such Motorola Software in Licensee's possession have been returned to Motorola or destroyed.

Section 10 NOTICES

All notices, consents, and waivers permitted or required under this Agreement will be deemed given upon receipt and must be delivered in writing to the below addresses. Change of address must be in writing to the other party.

CUSTOME	**City of Miami Beach**	**MOTOROLA, INC.**
Attn:	IT Director	Attn: Contracts & Compliance
Address 1:	1100 Washington Ave.	789 International Parkway, Rm.
City, St, Zip:	Miami Beach, FL 33139	Sunrise, FL 33325

Section 11 GENERAL

A. COPYRIGHT NOTICES. The existence of a copyright notice on Motorola Software will not be construed as an admission or presumption that public disclosure of Motorola Software or any trade secrets associated with Motorola Software has occurred.

B. WAIVERS. No waiver of a right or remedy of a party will constitute a waiver of another right or remedy of that party.

C. ASSIGNMENTS. Motorola may assign any of its rights or subcontract any of its obligations under this Agreement, or encumber or sell any of its rights in any Motorola Software, without prior notice to or consent of Licensee.

D. ENTIRE AGREEMENT AND AMENDMENT. This Agreement contains the parties' entire agreement regarding Licensee's use of Motorola Software and may be amended only in a writing signed by both parties, except that Motorola may modify this Agreement as necessary to comply with applicable laws and regulations including FCC regulations.

E. GOVERNING LAW. This Agreement will be governed by the laws of the United States of America to the extent that they apply and otherwise by the laws of the State of Florida. Any controversies or legal problems arising out of this Agreement and any action involving the enforcement or interpretation of any rights hereunder shall be submitted to the jurisdiction of the State Courts of the Eleventh Judicial Circuit of Miami-Dade County, Florida, the venue sites. By entering into this Agreement, Motorola and Licensee hereby expressly waive any rights either party may have to a trial by jury of any civil litigation related to, or arising out of this Agreement.

In witness whereof, the parties have caused duly authorized representatives to execute this Agreement on the dates set forth below.

Customer:	**Motorola, Inc.**
By:_____	By:_____
Name:_____	Name:Robert C. Wartmann
Title:_____	Title:MCEI Vice President, Sales
Date:_____	Date:_____

APPROVED AS TO FORM & LANGUAGE & FOR EXECUTION

City Attorney **Date** 4/24/03

EXHIBIT B MEMORANDUM OF NEGOTIATION

EXHIBIT B

MEMORANDUM OF NEGOTIATION

MEMORANDUM OF NEGOTIATION #1

Digital Voice Technology
(Section 1.2 of the Statement of Work)

The Equipment, Flashware and Software provided under this procurement shall be the latest versions available at the time of shipment to the Customer.

MEMORANDUM OF NEGOTIATION # 2

Workmanship

The Equipment shipped will be new.

MEMORANDUM OF NEGOTIATION # 3

Serviceability

Motorola will agree to repair all functionality defects necessary to maintain all functionalities outlined in the Statement of Work and Acceptance Test Plan, and maintain the System, including both Equipment and Software so that it continues to operate as designed, tested and accepted in accordance with the terms of this Agreement for as long as the City remains on a 3600 BAUD system and purchases an annual Maintenance Agreement with Motorola as quoted in the Pricing Summary Attachment, Addendum 1, Page 14 of 18, which includes the following services:

- Dispatch Service
- Technical Support Service
- Infrastructure Repair
- Radio Repair Service
- Onsite Infrastructure Response Service
- Microwave Repair

This commitment will expire ten (10) years from the date of System Acceptance. Motorola will be responsible for the cost of Software, Equipment and installation labor necessary to meet its commitment as stated above. As further clarification, the following is offered as an example of the intent of this commitment: Motorola will be responsible for the cost of Software, Equipment and installation labor necessary to maintain complete System functionality when the underlying Microsoft Operating System requires upgrading to resolve a Motorola functionality defect. The City will be responsible for all costs of software, hardware and installation labor related to other enhancements, upgrades or system modifications they elect to install. Motorola will maintain Motorola manufactured subscriber equipment for seven (7) years from the date of System Acceptance.

Memorandum of Negotiation #4

Liquidated Damages

If Motorola fails to deliver and install the Equipment in accordance with the Agreement, it is understood and Motorola hereby agrees, that the amount of $1000 per day, for a period of up to ninety (90) days shall be deducted from the monies due to Motorola for each intervening day of delay beyond the 365 days from the date of mutual acceptance of the DDR and any approved changes thereto, not as a penalty, but as liquidated damages. Except, Motorola shall not be liable if failure to perform arises out of causes beyond any Excuseable Delays. After ninety (90) days Customer reserves the right to enforce the provisions of the performance bond or continue the $1000 per day liquidated damages for a period, not to exceed, an additional ninety (90) days.

Memorandum of Negotiation # 5

Future Subscriber Pricing

The City may for a period of seven (7) years after the Effective Date of this Agreement purchase additional subscribers pursuant to the pricing and conditions set forth below:

1) Provided that the City gives Motorola an Executable Purchase Order for subscribers, Motorola will provide City with a 15% discount off subscriber list price at the time of order.

2) Provided that the City gives Motorola a Blanket and Executable for Purchase Order for products to be shipped within 24 months of order, Motorola will provide City of Miami Beach with $300 for each XTS subscriber trade-in for quantity orders of 200 or more.

3) Provided that the City gives Motorola a Blanket and Executable for Purchase Order for products to be shipped within 24 months of order, Motorola will provide City with $100 for each XTS subscriber trade-in for quantity orders of less than 200.

4) Provided that the City gives Motorola a Blanket and Executable for Purchase Order for products to be shipped within 24 months of order, Motorola will provide City with $100 for each MTS subscriber trade-in for quantity orders of 200 or more.

5) Pursuant to this pricing arrangement, Motorola will, for the time period specified above, sell the City XTS 5000 subscribers, exclusive of promotion pricing, at the same price of the XTS 3000 subscribers.

THE PRICING PROVISION HEREIN IS EXCLUSIVE TO THE CITY OF MIAMI BEACH AND CANNOT BE USED BY ANY OTHER MUNICIPAL OR GOVERNMENTAL ENTITY.

Memorandum of Negotiation # 6

Replacement Site(s)

If for any reason, any of the proposed sites cannot be utilized due to reasons beyond the control of Motorola, the costs identified in the Exhibits and associated with site changes and/or delays including, but not limited to, re-engineering, schedule delays, site preparations, re-mobilization, etc. will be identified in a 'Memorandum of Change' and will be negotiated with the City via the change order process as follows:

1. all costs for the site to be eliminated will be subtracted from the Contract Price;
2. costs of the new site will be added to the Contract Price per mutually agreed Change Order;
3. any Equipment used for the new sites will be at the price included in Motorola's Proposal;
4. all replacement site costs will be available to the City or its agents for review prior to any payment by the City; however, Motorola shall not be required to disclose any of its confidential or proprietary cost or pricing data.

Costs associated with the change of the 75th Street Water Reservoir Site to a building top site, will not exceed those as originally proposed. The City will be responsible for filings and fees to the corresponding agency(s) for procurement of all radio system frequencies relating to the relocation. It shall be understood, the City is responsible for obtaining all radio frequencies. The City will be responsible to conduct all negotiations for acquisition of property for the lease or joint use of sites not owned. Prior to the start of work, the City will provide properly executed leases and/or owned property with legal description of site including Latitude and Longitude in accordance with State regulatory Agency(s). The City shall provide a copy of current documents that clearly state the proposed use is permitted. If changes or generation of these documents are required, a separate quotation, and costs will be negotiated via the change order process.

Memorandum of Negotiation #7

Turnkey System

Motorola's Proposal is "turnkey" and shall include all Equipment, Software and services required to implement the System. User quantities are complete and accurate. All additional portables, mobiles and control stations required to fully implement digital public safety dispatch operations are included in the price proposal. There are no additional components and related costs require to meet the requirements of the City's SOW for a turnkey system as mutally amended in the Communications System Agreement.

Exhibit C Maintenance Agreement

Exhibit C

Maintenance Agreement

Exhibit C

Maintenance Terms and Conditions

Motorola, Inc., through its Commercial, Government, and Industrial Solutions Sector ("Motorola"), and the customer named in this Agreement ("Customer"), hereby agree as follows:

Section 1 APPLICABILITY

These Service Terms and Conditions apply to service contracts whereby Motorola agrees to provide to Customer either (1) maintenance, support and/or other services under a Motorola Service Agreement, or (2) installation services under a Motorola Installation Agreement.

Section 2 DEFINITIONS AND INTERPRETATION

"Agreement" means these Service Terms and Conditions; the cover page for the Service Agreement; and any other attachments, all of which are incorporated herein by this reference. In interpreting this Agreement and resolving any ambiguities, these Service Terms and Conditions will take precedence over any cover page, and the cover page will take precedence over any attachments, unless the cover page or attachment specifically states otherwise. "Equipment" means the communication equipment that is specified in the attachments or is subsequently added to this Agreement. "Services" means those installation, maintenance, support, training, and other services described in this Agreement.

Section 3 ACCEPTANCE

Customer accepts these Service Terms and Conditions and agrees to pay the prices set forth in the Agreement. This Agreement will become binding only when accepted in writing by both parties. The term of this Agreement will begin on the "Start Date" indicated in this Agreement.

Section 4 SCOPE OF SERVICES

4.1. Motorola will provide the Services described in this Agreement or in a more detailed Statement of Work or other attachment. At Customer's request, Motorola may also provide additional services at Motorola's then-applicable rates for such services.

4.2. If Motorola is providing Services for Equipment, Motorola parts or parts of equal quality will be used; the Equipment will be Serviced at levels set forth in the manufacturer's product manuals; and routine service procedures that are prescribed by Motorola will be followed.

4.3. If Customer purchases from Motorola additional equipment that becomes part of the same system as the initial Equipment, the additional equipment may be added to this Agreement and will be billed at the currently charged rates for the Maintenance Agreement for like Equipment. If no like Equipment is currently on the Maintenance Agreement, Customer will then be billed at the applicable rates after the warranty for such additional equipment expires.

4.4. Any additional equipment must be in good working order when the additional equipment is added to the Agreement. Customer must promptly notify Motorola in writing when any Equipment or any additional equipment is lost, damaged, stolen or taken out of service. If Equipment or any additional equipment is added or removed prior to the end of the month, Motorola will complete an inventory adjustment form and Customer will pay a prorated increased amount for added Equipment or additional equipment, or receive a prorated, mutually agreeable credit for removed Equipment or additional equipment.

4.5. Motorola must specifically identify any Equipment that is labeled intrinsically safe for use in hazardous environments.

4.6. After the 10 year serviceability period, if Equipment cannot, in Motorola's opinion, be properly or economically serviced for any reason including excessive wear, unavailability of parts, the state of technology, or practical infeasibility, Motorola may modify the scope of Services related to such Equipment; or increase the price to Service such Equipment or remove such Equipment from the Agreement. Where Equipment is removed from the Agreement under this provision, Motorola will use reasonable commercially available means to repair such Equipment on a Time and Materials basis.

4.7. Customer must promptly notify Motorola directly of any Equipment failure. Motorola will respond to Customer's notification in a manner consistent with the level of Service purchased as indicated in this Agreement.

Section 5 EXCLUDED SERVICES

Service excludes the repair or replacement of Equipment that has become defective or damaged from use in other than the normal, customary, intended, and authorized manner; use not in compliance with applicable industry standards; or accident, foreign liquids, power surges, neglect, acts of God or other force majeure events.

Unless specifically included in this Agreement, Service excludes items that are consumed in the normal operation of the Equipment, such as batteries, magnetic tapes, etc.; upgrading Equipment; accessories, belt clips, battery chargers, custom or special products, modified units, or software; and repair or maintenance of any transmission line, antenna, tower or tower lighting, duplexer, or combiner. Motorola has no obligations for any transmission medium, such as telephone lines, computer networks, the internet or the worldwide web, or for Equipment malfunction caused by such transmission medium.

Section 6 TIME AND PLACE OF SERVICE

Service will be provided at the location specified in this Agreement. When Motorola performs service at Customer's location, Customer will provide Motorola, at no charge, a non-hazardous work environment with adequate shelter, heat, light, and power and with full and free access to the Equipment. Waivers of liability from Motorola or its subcontractors will not be imposed as a site access requirement. Customer will provide all information pertaining to the hardware and software elements of any system with which the Equipment is interfacing so that Motorola may perform its Services. The hours of subscriber Service will be 8:30 a.m. to 5:30 p.m., local time, excluding weekends and holidays. Infrastructure emergency support will be provided 24 hours a day, 7days a week, including holidays. A technician will be on site or working on City equipment from 8:30 a.m. to 5:30 p.m. local time, excluding weekends and holidays. Unless otherwise stated in this Agreement, the price for the Services exclude any charges or expenses associated with helicopter or other unusual access requirements; if these charges or expenses are reasonably incurred by Motorola in rendering the Services, Customer agrees to reimburse Motorola for such charges and expenses.

Section 7 CUSTOMER CONTACT

Customer will provide Motorola with designated points of contact (list of names and phone numbers) that will be available twenty-four (24) hours per day, seven (7) days per week, and an escalation procedure to enable Customer's personnel to maintain contact, as needed, with Motorola.

Section 8 PAYMENT

Unless alternative payment terms are specifically stated in this Agreement, Motorola will invoice Customer in advance for each payment period. All other charges will be billed monthly, and Customer must pay each invoice in U.S. dollars within forty-five (45) days of the invoice date. Customer agrees to reimburse Motorola for all property taxes, excise taxes, and other taxes or assessments levied as a result of Services rendered under this Agreement (except income, profit, and franchise taxes of Motorola) by any governmental entity.

Section 9 WARRANTY

Motorola warrants that its Services under this Agreement will be free of defects in materials and workmanship for a period of ninety (90) days following completion of those Services. MOTOROLA DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Section 10 DEFAULT/TERMINATION

10.1. If either party defaults in the performance of this Agreement, the other party will give to the defaulting party a written and detailed notice of the default. The defaulting party will have thirty (30) days thereafter to provide a written plan to cure the default that is acceptable to the other party and begin implementing the cure plan immediately after plan approval. If, after notice to the City and the period to cure has passed, the City fails to make payment to Motorola in accordance with the terms of this Agreement, Motorola will have the right to terminate this Agreement in writing.

10.2. Any termination of this Agreement will not relieve either party of obligations previously incurred under this Agreement, including payments which may be due and owing at the time of termination. All sums owed by Customer to Motorola, per the payment terms of the Purchase Order, will become due and payable immediately upon termination of this Agreement. Upon the effective date of termination, Motorola will have no further obligation to provide Services.

Section 11 LIMITATION OF LIABILITY

This limitation of liability provision shall apply notwithstanding any contrary provision in this Agreement. Except for personal injury or death, Motorola's total liability, whether for breach of contract, warranty, negligence, strict liability in tort, or otherwise, will be limited to the direct damages recoverable under law, but not to exceed the price of the previous twelve (12) months of Service provided under this Agreement. MOTOROLA WILL NOT BE LIABLE FOR ANY COMMERCIAL LOSS; INCONVENIENCE; LOSS OF USE, TIME, DATA, GOOD WILL, REVENUES, PROFITS OR SAVINGS; OR OTHER SPECIAL, INCIDENTAL, INDIRECT, OR CONSEQUENTIAL DAMAGES IN ANY WAY RELATED TO OR ARISING FROM THIS AGREEMENT. This limitation of liability will survive the expiration or termination of this Agreement.

Section 12 EXCLUSIVE TERMS AND CONDITIONS

12.1. This Agreement supersedes all prior and concurrent agreements and understandings between the parties, whether written or oral, related to the Services, and there are no agreements or representations concerning the subject matter of this Agreement except for those expressed herein. The Agreement may not be amended or modified except by a written agreement signed by authorized representatives of both parties.

12.2. Customer agrees to reference this Agreement on any purchase order issued in furtherance of this Agreement, however, an inadvertent omission of the reference to this Agreement shall not affect its applicability. In no event shall either party be bound by any terms contained in a Customer purchase order, acknowledgement, or other writings unless: (i) such purchase order, acknowledgement, or other writings specifically refer to this Agreement; (ii) clearly indicate the intention of both parties to override and modify this Agreement; and (iii) such purchase order, acknowledgement, or other writings are signed by authorized representatives of both parties.

Section 13 PROPRIETARY INFORMATION; CONFIDENTIALITY; INTELLECTUAL PROPERTY

13.1. Any information or data in the form of specifications, drawings, reprints, technical information or otherwise furnished to Customer under this Agreement will remain Motorola's property, will be deemed proprietary, will be kept confidential, and will be promptly returned at Motorola's request. Customer may not disclose, without Motorola's written permission or as required by law, any such information or data to any person, or use such information or data itself for any purpose other than performing its obligations under this Agreement. The obligations in this Section will survive the expiration or termination of this Agreement.

13.2. Unless otherwise agreed in writing, no business or technical information disclosed in any manner or at any time by Customer to Motorola will be deemed secret or confidential. Motorola will have no obligation to provide its confidential and proprietary information, including cost and pricing data, to Customer.

13.3. This Agreement does not grant directly or by implication, estoppel, or otherwise, any ownership right or license under any Motorola patent, copyright, trade secret, or other intellectual property including any intellectual property created as a result of or related to the Equipment sold or Services performed under this Agreement.

Section 14 FCC LICENSES AND OTHER AUTHORIZATIONS

Customer is solely responsible for obtaining licenses or other authorizations required by the Federal Communications Commission or any other federal, state, or local government agency and for complying with all rules and regulations required by such agencies. Neither Motorola nor any of its employees is an agent or representative of Customer in any governmental matters.

Section 15 COVENANT NOT TO EMPLOY

During the term of this Agreement and continuing for a period of two (2) years thereafter, Customer will not solicit for hire and engage on contract any employee of Motorola or its subcontractors. This provision applies only to those employees of Motorola or its subcontractors who are responsible for rendering services under this Agreement. If this provision is found to be overly broad under applicable law, it shall be modified as necessary to conform to such law.

Section 16 MATERIALS, TOOLS AND EQUIPMENT

All tools, equipment, dies, gauges, models, drawings (excluding as built documentation, drawings and records pertaining to this Agreement) or other materials paid for or furnished by Motorola for the purpose of this Agreement will be and remain the sole property of Motorola. Customer will safeguard all such property while it is in Customer's custody or control, be liable for any loss or damage to such property, and return it to Motorola upon request. Such property will be held by Customer for Motorola's use without charge and may be removed from Customer's premises by Motorola at any time without restriction.

Section 17 GENERAL TERMS

17.1. If any court renders any portion of this Agreement unenforceable, the remaining terms will continue in full force and effect.

17.2. This Agreement and the rights and duties of the parties will be governed and interpreted in accordance with the laws of the State of Florida.

17.3. Failure to exercise any right will not operate as a waiver of that right, power, or privilege.

17.4. Neither party is liable for delays or lack of performance resulting from any causes such as strikes, material shortages, or acts of God that are beyond that party's reasonable control.

17.5. Motorola may assign its rights and obligations, and may subcontract any portion of its performance, under this Agreement.

17.6. THIS AGREEMENT WILL BECOME EFFECTIVE FOLLOWING EXPIRATION OF THE APPLICABLE WARRANTY PERIOD IN THE COMMUNICATIONS SYSTEM AGREEMENT AND TERMINATE AFTER THE EXPIRATION OF 9TH SERVICE YEAR. THEREAFTER THIS CONTRACT MAY BE RENEWED BY MUTUAL AGREEMENT BY THE PARTIES, FOR AN ADDITIONAL ONE (1) YEAR TERM, ON EVERY ANNIVERSARY OF THE START DATE UNLESS ONE PARTY NOTIFIES THE OTHER IN WRITING OF ITS INTENTION TO DISCONTINUE THE AGREEMENT NOT LESS THAN THIRTY (30)

DAYS OF THAT ANNIVERSARY DATE. FOR ANY RENEWAL PERIOD FOLLOWING THE EXPIRATION OF THE 9TH SERVICE YEAR, , MOTOROLA MAY ADJUST THE PRICE OF THE SERVICES TO REFLECT ITS CURRENT RATES.

17.7. If Motorola provides Services after the termination or expiration of this Agreement, the terms and conditions in effect at the time of the termination or expiration will apply to those Services and Customer agrees to pay for such services on a time and materials basis at Motorola's then effective hourly rates.

IN WITNESS WHEREOF:

Custome	City of Miami Beach, Fl	**Motorola.**	
By:		By:	
Name:		Name:	Robert C. Wartmann
Title:		Title:	MCEI Vice President, Sales
Date:		Date:	

APPROVED AS TO FORM & LANGUAGE & FOR EXECUTION

City Attorney 4/25/03 **Date**

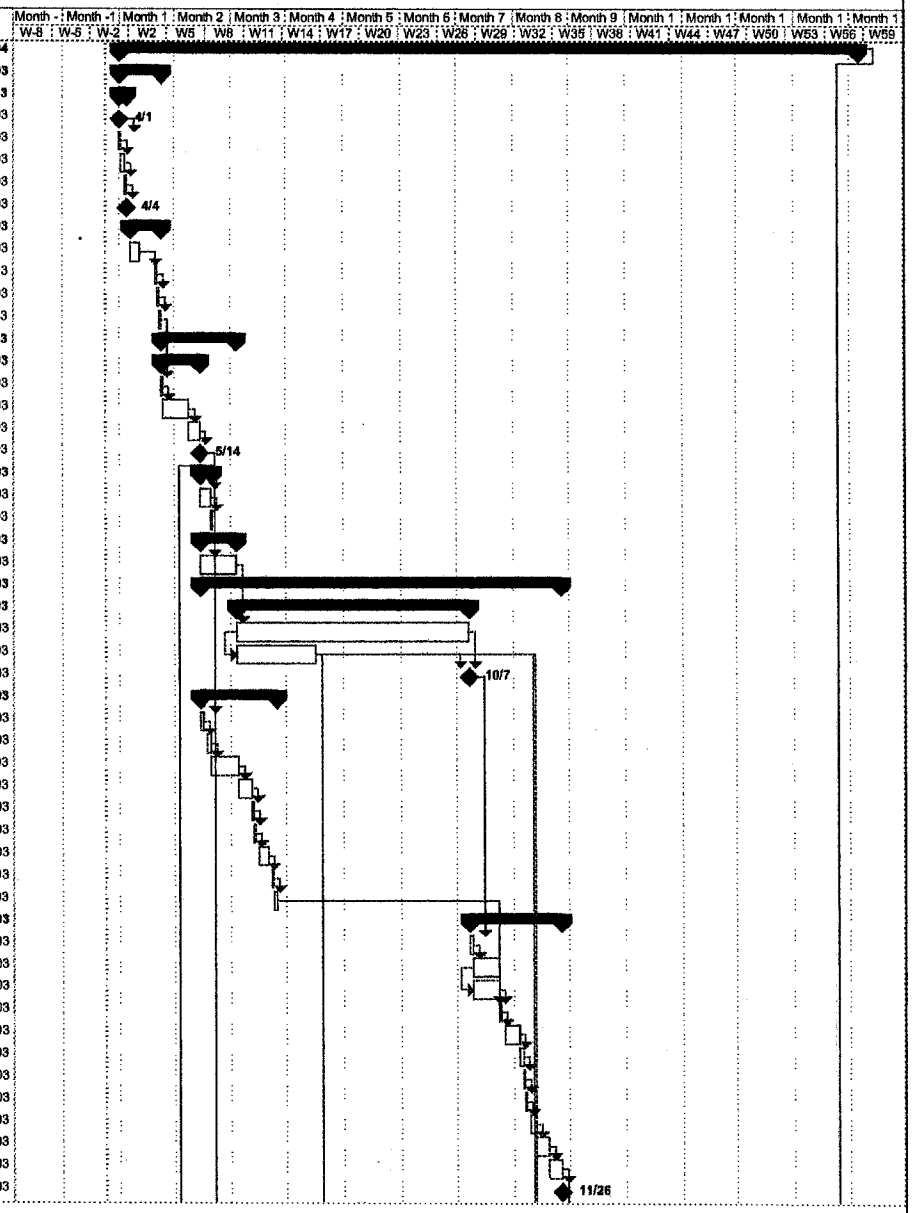
Exhibit D **Performance Schedule**

Exhibit D

Performance Schedule

Proposed City Of Miami Beach Timeline

ID	task type	task_ID	Task Name	Start	Finish
1	Summary	ImpProj	**Implementation Project**	**Tue 4/1/03**	**Wed 5/5/04**
2	Phase	Cont	**Contract**	**Tue 4/1/03**	**Wed 4/23/03**
3	Activity	ContAdm	**Contract Administration**	**Tue 4/1/03**	**Fri 4/4/03**
4	Milestone	ContAdmAward	Contract Award	Tue 4/1/03	Tue 4/1/03
5	Task	ContAdmOpen	Open Post-Sale Project	Tue 4/1/03	Tue 4/1/03
6	Task	ContAdmRev	Review req cust docs	Wed 4/2/03	Thu 4/3/03
7	Task	ContAdmCRC	Submit CRC docs	Fri 4/4/03	Fri 4/4/03
8	Milestone	ContAdmPO	PO received	Fri 4/4/03	Fri 4/4/03
9	Activity	PrjKO	**Project Kick-Off**	**Mon 4/7/03**	**Wed 4/23/03**
10	Task	PrjKOData	Assemble kick-off data	Mon 4/7/03	Fri 4/11/03
11	Task	PrjKOInt	Internal project kick-off	Mon 4/21/03	Mon 4/21/03
12	Task	PrjKODel	Define customer deliverables	Tue 4/22/03	Tue 4/22/03
13	Task	PrjKOCust	Customer project kick-off	Wed 4/23/03	Wed 4/23/03
14	Phase	IDR	**Design Review**	**Thu 4/24/03**	**Tue 6/3/03**
15	Activity	IDDR	**Post-Sale Customer Design Review**	**Thu 4/24/03**	**Wed 5/14/03**
16	Task	IDDRCust	Customer acquired sites agreed upon	Thu 4/24/03	Thu 4/24/03
17	Task	IDDRCust	Customer Design Review	Fri 4/25/03	Thu 5/8/03
18	Task	IDDRInt	Internal meeting	Fri 5/9/03	Wed 5/14/03
19	Milestone	IDDRApp	Final approval with customer	Wed 5/14/03	Wed 5/14/03
20	Activity	CCSIKO	**CCSI Kick-Off**	**Thu 5/15/03**	**Wed 5/21/03**
21	Task	CCSIKODoc	Assemble CCSI document	Thu 5/15/03	Tue 5/20/03
22	Task	CCSIKOInt	Internal project kick-off with CCSI	Wed 5/21/03	Wed 5/21/03
23	Activity	OrdFO	**Factory Order**	**Thu 5/15/03**	**Tue 6/3/03**
24	Milestone	OrdBrdg	Order Bridged	Thu 5/15/03	Tue 6/3/03
25	Phase	Mnfg	**Manufacturing**	**Thu 5/15/03**	**Wed 11/26/03**
26	Activity	MnfgEqp	**Equipment Manufacturing**	**Wed 6/4/03**	**Tue 10/7/03**
27	Task	MnfgFNE	Manufacture FNE	Wed 6/4/03	Tue 10/7/03
28	Task	MnfgNSFNE	Manufacture Non Staged FNE	Wed 6/4/03	Wed 7/16/03
29	Milestone	MnfgStgShip	Ship to Staging	Tue 10/7/03	Tue 10/7/03
30	Activity	FltMap	**Fleet Mapping**	**Thu 5/15/03**	**Wed 6/25/03**
31	Task	FltMapOpRev	Review Operational Rqmts with customer	Thu 5/15/03	Fri 5/16/03
32	Task	FltMapFtrTra	Train customer on system features	Mon 5/19/03	Tue 5/20/03
33	Task	FltMapDev	Develop Fleetmap	Wed 5/21/03	Wed 6/4/03
34	Task	FltMapTemp	Develop Templates	Thu 6/5/03	Wed 6/11/03
35	Task	FltMapProd	Produce Proposed Fleet Map	Thu 6/12/03	Thu 6/12/03
36	Task	FltMapRvw	Review Fleet Map with customer/approval	Fri 6/13/03	Fri 6/13/03
37	Task	FltMapApp	Fleet Map approval	Mon 6/16/03	Fri 6/20/03
38	Task	FltMapProg	Program Templates	Mon 6/23/03	Mon 6/23/03
39	Task	FltMapBeta	Beta-Test Templates	Tue 6/24/03	Wed 6/25/03
40	Activity	Stage	**Staging**	**Wed 10/8/03**	**Wed 11/26/03**
41	Task	StgPreDoc	Pre-staging documentation	Wed 10/8/03	Thu 10/9/03
42	Task	StgRxInv	Receipt and inventory equipment	Fri 10/10/03	Thu 10/23/03
43	Task	StgAsm-2w	Assemble equipment 2wk	Fri 10/10/03	Thu 10/23/03
44	Task	StgPrg-1w	Program equipment 1wk	Fri 10/24/03	Fri 10/24/03
45	Task	StgPreSATP-3d	PreSATP at CCSI	Mon 10/27/03	Mon 11/3/03
46	Task	StgSATP-2d	SATP 2d	Tue 11/4/03	Wed 11/5/03
47	Task	StgDemo-3d	Demonstrate system 3d	Thu 11/6/03	Thu 11/6/03
48	Task	StgAcc	Acceptance by Customer	Fri 11/7/03	Fri 11/7/03
49	Task	StgRpk-5d	Repackage Equipment 5d	Mon 11/10/03	Wed 11/12/03
50	Task	StgDoc	Documentation	Thu 11/13/03	Wed 11/19/03
51	Task	StgShip	Ship equipment to field	Thu 11/20/03	Wed 11/26/03
52	Milestone	CCSIShip	CCSI Ship	Wed 11/26/03	Wed 11/26/03

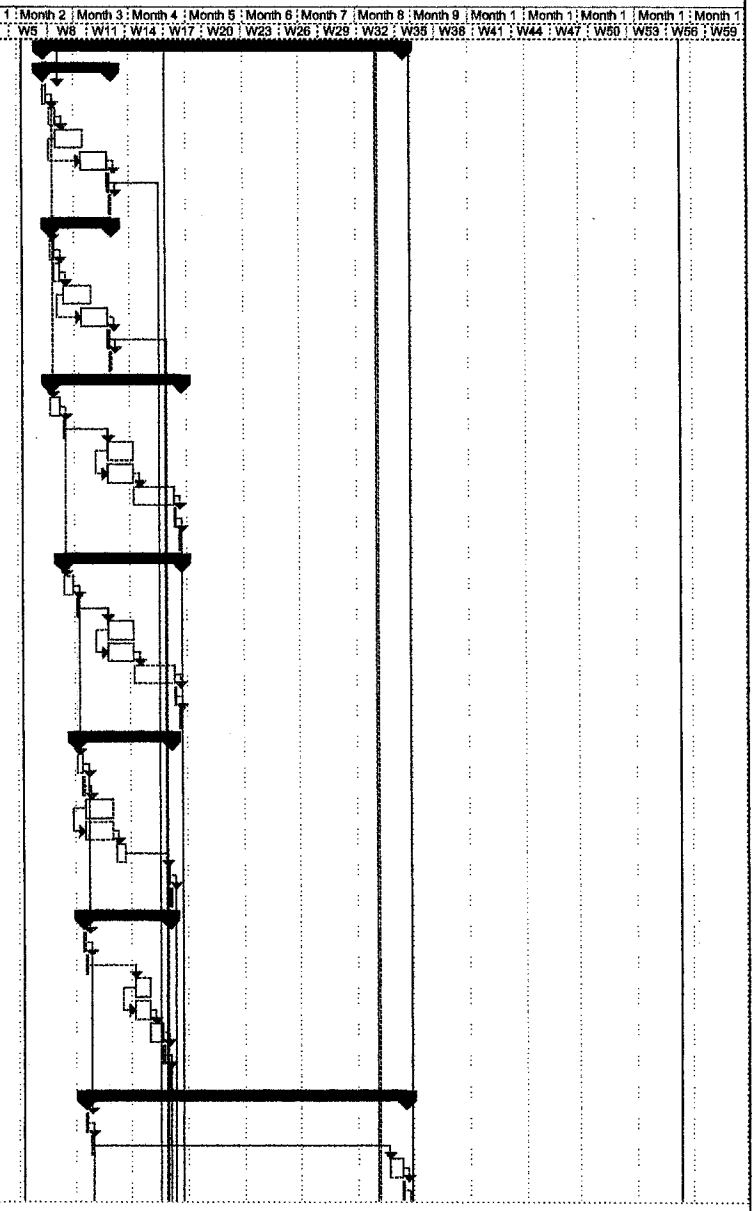


Project: City Of Miami Beach
Project Manager : Mark A. Cabra
Updated : Mon 3/24/03

Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

Proposed City Of Miami Beach Timeline

ID	task type	task ID	Task Name	Start	Finish
53	Phase	Civil	**Site Preparations**	**Thu 5/15/03**	**Wed 11/26/03**
54	Activity	CivilPS1	**CEB/Prime Site**	**Thu 5/15/03**	**Fri 6/20/03**
55	Task	CivilPS1-1	conduct site survey at PD stations	Thu 5/15/03	Fri 5/16/03
56	Task	CivilPS1-3	Contract services for CEB/PrimeSite	Mon 5/19/03	Wed 5/21/03
57	Task	CivilPS1-4	Upgrade Electrical service in CEB Room	Thu 5/22/03	Thu 6/5/03
58	Task	CivilPS1-5	Upgrade Grounding at CEB ROOM	Thu 6/5/03	Wed 6/18/03
59	Task	CivilPS1-6	Cleanup for CEB/Prime site	Thu 6/19/03	Thu 6/19/03
60	Task	CivilPS1-7	Documentation for CEB/Prime site	Fri 6/20/03	Fri 6/20/03
61	Activity	CivilPS2	**Dispatch Center**	**Mon 5/19/03**	**Fri 6/20/03**
62	Task	CivilPS2-6	Conduct Site Survey at Dispatch Center	Mon 5/19/03	Tue 5/20/03
63	Task	CivilPS2-6-6	Contract services fro Disp Center	Wed 5/21/03	Fri 5/23/03
64	Task	CivilPS2-2	Upgrade Electrical Services in Dispatch Center	Mon 5/26/03	Mon 6/9/03
65	Task	CivilPS2-3	Upgrade Grounding ay Dispatch Center	Thu 6/5/03	Wed 6/18/03
66	Task	CivilPS2-4	Clean-up for Disp Cent	Thu 6/19/03	Thu 6/19/03
67	Task	CivilPS2-5	Documentation for Disp Cent	Fri 6/20/03	Fri 6/20/03
68	Activity	CivilPS3	**Rebecca Towers**	**Mon 5/19/03**	**Mon 7/28/03**
69	Task	CivilPS3-3	Conduct Survey at RT	Mon 5/19/03	Fri 5/23/03
70	Task	CivilPS3-3-3	Contract services for RT	Mon 5/26/03	Mon 5/26/03
71	Task	CivilPS3-4	Upgrade Electrical Servies at RT	Thu 6/19/03	Wed 7/2/03
72	Task	CivilPS3-5	Upgrade Grounding at RT	Thu 6/19/03	Wed 7/2/03
73	Task	CivilPS3-6	Renovation of RT	Thu 7/3/03	Thu 7/24/03
74	Task	CivilPS3-6-6	Clean-up for RT	Fri 7/25/03	Fri 7/25/03
75	Task	CivilPS3-6-7	Document for RT	Mon 7/28/03	Mon 7/28/03
76	Activity	CivilPS4	**Tower 41**	**Mon 5/26/03**	**Mon 7/28/03**
77	Task	CivilPS4-4	Conduct Survey at tower 41	Mon 5/26/03	Fri 5/30/03
78	Task	CivilPS4-5	Contract services for tower 41	Mon 6/2/03	Mon 6/2/03
79	Task	CivilPS4-6	Upgrade Electrical Servies at Tower 41	Thu 6/19/03	Wed 7/2/03
80	Task	CivilPS4-7	Upgrade Grounding at Tower 41	Thu 6/19/03	Wed 7/2/03
81	Task	CivilPS4-8	Refurbishment at tower 41	Thu 7/3/03	Thu 7/24/03
82	Task	CivilPS4-9	Clean-up at Tower 41	Fri 7/25/03	Fri 7/25/03
83	Task	CivilPS4-10	Document for Tower 41	Mon 7/28/03	Mon 7/28/03
84	Activity	CivilPS5	**Old City Hall**	**Mon 6/2/03**	**Tue 7/22/03**
85	Task	CivilPS5-5	Conduct Survey at Old City hall	Mon 6/2/03	Wed 6/4/03
86	Task	CivilPS5-6	Contract services for Old City Hall	Thu 6/5/03	Thu 6/5/03
87	Task	CivilPS5-7	Upgrade Electrical Servies for Old City hall	Fri 6/6/03	Fri 6/20/03
88	Task	CivilPS5-8	Upgrade Grounding for old city hall	Fri 6/6/03	Fri 6/20/03
89	Task	CivilPS5-9	Renovation for old city hall	Mon 6/23/03	Fri 6/27/03
90	Task	CivilPS5-10	Clean-up for old city hall	Mon 7/21/03	Mon 7/21/03
91	Task	CivilPS5-11	Document for old city hall	Tue 7/22/03	Tue 7/22/03
92	Activity	CivilPS6-6	**New City Hall**	**Thu 6/5/03**	**Mon 7/21/03**
93	Task	CivilPS6-6-6	Conduct Survey for new city hall	Thu 6/5/03	Thu 6/5/03
94	Task	CivilPS6-6-7	Contract services for new city hall	Fri 6/6/03	Fri 6/6/03
95	Task	CivilPS6-6-8	Upgrade Electrical services for new city hall	Thu 7/3/03	Thu 7/10/03
96	Task	CivilPS6-6-9	Upgrade Grounding for new city hall	Thu 7/3/03	Thu 7/10/03
97	Task	CivilPS6-6-10	Renovation for new city hall	Fri 7/11/03	Thu 7/17/03
98	Task	CivilPS6-6-11	Clean-up for new city hal	Fri 7/18/03	Fri 7/18/03
99	Task	CivilPS6-6-12	Document for new city hall	Mon 7/21/03	Mon 7/21/03
100	Activity	CivilPS7	**LaGorce**	**Fri 6/6/03**	**Wed 11/26/03**
101	Task	CivilPS7-7	Conduct Survey for lagorce	Fri 6/6/03	Fri 6/6/03
102	Task	CivilPS7-8	Contract services for lagorce	Mon 6/9/03	Mon 6/9/03
103	Task	CivilPS7-11	Renovation for lagorce	Tue 11/18/03	Mon 11/24/03
104	Task	CivilPS7-12	Clean-up for lagorce	Tue 11/25/03	Tue 11/25/03



Project: City Of Miami Beach
Project Manager : Mark A. Cabra
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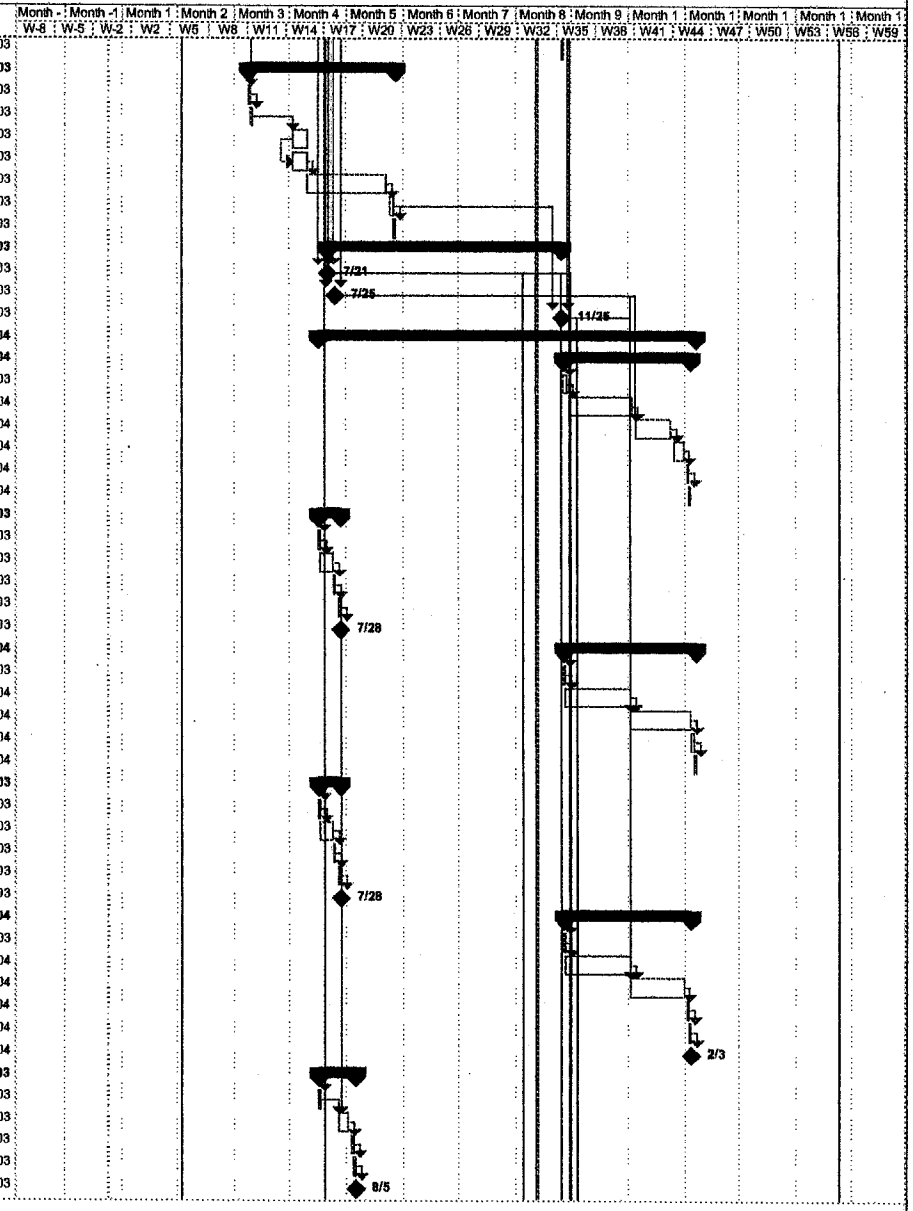
Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

Proposed City Of Miami Beach Timeline

ID	task type	task ID	Task Name	Start	Finish
105	Task	CivilPS7-13	Document for Iagorce	Wed 11/26/03	Wed 11/26/03
106	**Activity**	**CivilPS7-9**	**Fire Station 2**	**Mon 6/9/03**	**Wed 8/27/03**
107	Task	CivilPS7-9-9	Conduct Survey for FS2	Mon 6/9/03	Mon 6/9/03
108	Task	CivilPS7-9-10	Contract services for FS2	Tue 6/10/03	Tue 6/10/03
109	Task	CivilPS6-6-8-8	Upgrade Electrical services for new ckity hall	Thu 7/3/03	Thu 7/10/03
110	Task	CivilPS6-6-9-9	Upgrade Grounding for new city hall	Thu 7/3/03	Thu 7/10/03
111	Task	CivilPS7-9-11	Renovation for FS2	Fri 7/11/03	Fri 8/22/03
112	Task	CivilPS7-9-12	Clean-up for FS2	Mon 8/25/03	Tue 8/26/03
113	Task	CivilPS7-9-13	Document for FS2	Wed 8/27/03	Wed 8/27/03
114	**Activity**	**Admin CIVIL**	**Admin Site Preparation**	**Mon 7/21/03**	**Tue 11/25/03**
115	Milestone	Admin CIVIL-0	Site Prep complete NCH , OCH,Primesite	Mon 7/21/03	Mon 7/21/03
116	Milestone	Admin CIVIL-1	Site Prep Complete, 41, DISP Cent	Fri 7/25/03	Fri 7/25/03
117	Milestone	Admin CIVIL-2	Site Prep Complete at Iagorce , fs2	Tue 11/25/03	Tue 11/25/03
118	**Phase**	**FNE 1**	**Equipment Installation**	**Thu 7/17/03**	**Fri 2/6/04**
119	**Activity**	**FNE 1-1**	**Rebecca Tower FNE**	**Thu 11/27/03**	**Tue 2/3/04**
120	Task	FNE 1-1-1	Recieve and Inventory	Thu 11/27/03	Fri 11/28/03
121	Task	FNEStor 1	Storage	Mon 12/1/03	Fri 1/2/04
122	Task	FNEVc 1	Site Pwer Up	Mon 1/5/04	Fri 1/23/04
123	Task	FNEOpt 1	Hardware Link Verification	Mon 1/26/04	Fri 1/30/04
124	Task	FNEClnup 1	Clean-up	Mon 2/2/04	Mon 2/2/04
125	Task	FNEClnup 1-1	Documentation	Tue 2/3/04	Tue 2/3/04
126	**Activity**	**Ant 1**	**Rebecca Tower Antenna System Installation**	**Thu 7/17/03**	**Mon 7/28/03**
127	Task	AntRxInv 1	Receive and Inventory	Thu 7/17/03	Thu 7/17/03
128	Task	AntInst 1	Install	Fri 7/18/03	Thu 7/24/03
129	Task	AntTest 1	test	Fri 7/25/03	Fri 7/25/03
130	Task	AntDoc 1	Document	Mon 7/28/03	Mon 7/28/03
131	Milestone	AntCpt 1	Antenna System Complete	Mon 7/28/03	Mon 7/28/03
132	**Activity**	**FNE 2**	**Fire Station 2 Installation**	**Thu 11/27/03**	**Fri 2/6/04**
133	Task	FNERxInv 2	Receive and Inventory	Thu 11/27/03	Thu 11/27/03
134	Task	FNEStor 2	Storage	Fri 11/28/03	Thu 1/1/04
135	Task	FNEVc 2	Installation equipment at FS2	Fri 1/2/04	Tue 2/3/04
136	Task	FNELnkVer 2	Link Verification	Wed 2/4/04	Thu 2/5/04
137	Task	FNEClnup 2	Clean-up	Fri 2/6/04	Fri 2/6/04
138	**Activity**	**Ant 2**	**Fire Station 2 Antenna System Installation**	**Thu 7/17/03**	**Mon 7/28/03**
139	Task	AntRxInv 2	Receive and Inventory	Thu 7/17/03	Thu 7/17/03
140	Task	AntInst 2	Install	Fri 7/18/03	Thu 7/24/03
141	Task	AntTest 2	Test	Fri 7/25/03	Fri 7/25/03
142	Task	AntDoc 2	Document	Mon 7/28/03	Mon 7/28/03
143	Milestone	AntCpt 2	Antenna System Complete	Mon 7/28/03	Mon 7/28/03
144	**Activity**	**FNE 3**	**Tower 41 FNE Installation**	**Thu 11/27/03**	**Tue 2/3/04**
145	Task	FNERxInv 3	Receive and inventory	Thu 11/27/03	Thu 11/27/03
146	Task	FNEStor 3	Storage	Fri 11/28/03	Thu 1/1/04
147	Task	FNEVc 3	Installation Voice	Fri 1/2/04	Fri 1/30/04
148	Task	FNEClnup 3	Power Up	Mon 2/2/04	Mon 2/2/04
149	Task	FNEDoc 3	Documentation	Tue 2/3/04	Tue 2/3/04
150	Milestone	FNECpt 3	FNE Installation Complete	Tue 2/3/04	Tue 2/3/04
151	**Activity**	**Ant 3**	**Tower 41 Antenna System Installation**	**Thu 7/17/03**	**Tue 8/5/03**
152	Task	AntRxInv 3	Receive and Inventory	Thu 7/17/03	Thu 7/17/03
153	Task	AntInst 3	Install	Mon 7/28/03	Fri 8/1/03
154	Task	AntTest 3	Test	Mon 8/4/03	Mon 8/4/03
155	Task	AntDoc 3	Document	Tue 8/5/03	Tue 8/5/03
156	Milestone	AntCpt 3	Antenna System Complete	Tue 8/5/03	Tue 8/5/03



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Project Manager : Mark A. Cabra
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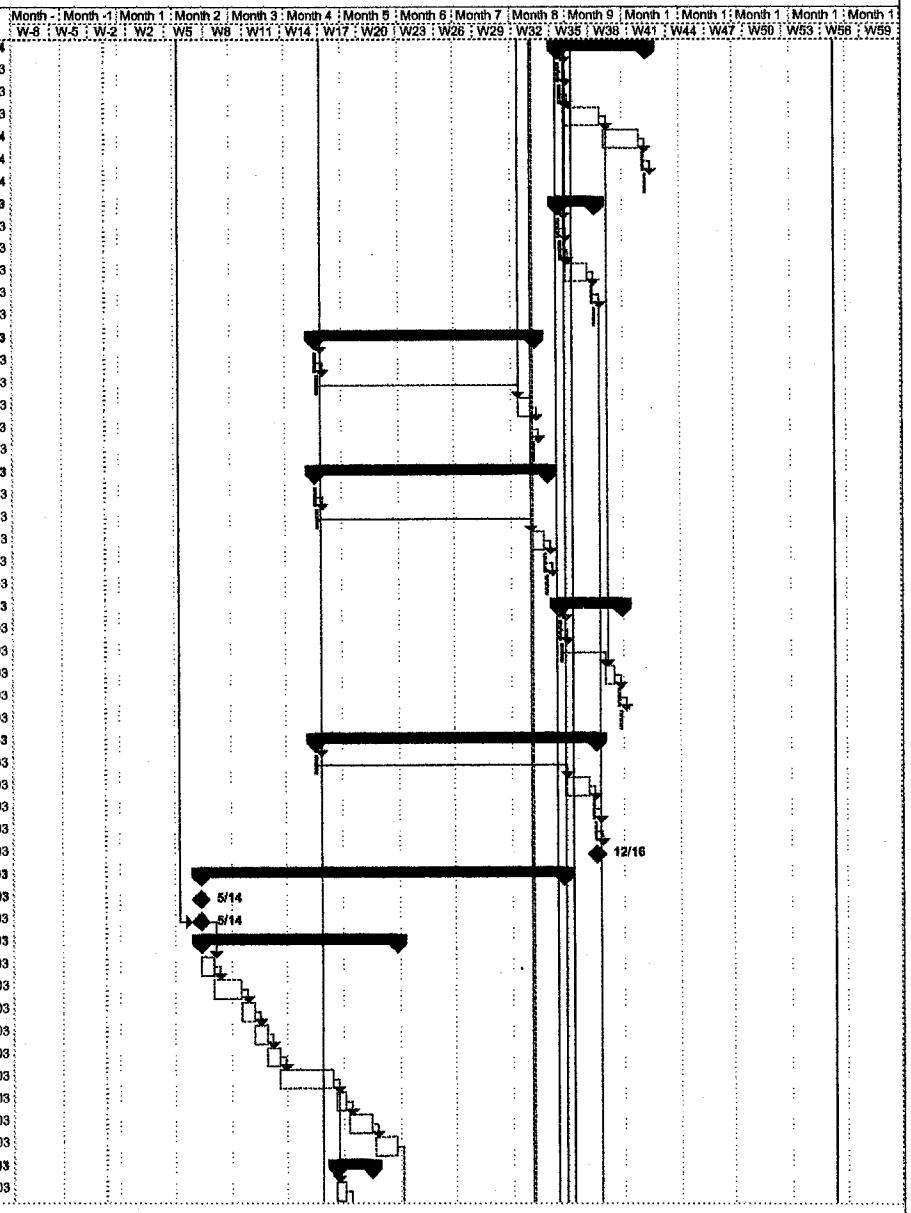
Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

Proposed City Of Miami Beach Timeline

ID	task type	task ID	Task Name	Start	Finish
157	**Activity**	**FNE4**	**Primesite**	**Thu 11/27/03**	**Tue 1/13/04**
158	Task	FNE4-4	Receive and Inventory	Thu 11/27/03	Thu 11/27/03
159	Task	FNE4-5	Storage	Fri 11/28/03	Fri 11/28/03
160	Task	FNE4-6	Installation of controller equipment	Mon 12/1/03	Fri 12/19/03
161	Task	FNE4-7	Inatallation of CEBS	Mon 12/22/03	Fri 1/9/04
162	Task	FNE4-8	Cleanup	Mon 1/12/04	Mon 1/12/04
163	Task	FNE4-8-8	documentation for PrimeSite	Tue 1/13/04	Tue 1/13/04
164	**Activity**	**FNE5**	**Dispatch Center**	**Thu 11/27/03**	**Tue 12/16/03**
165	Task	FNE5-5	Receive and Inventory	Thu 11/27/03	Thu 11/27/03
166	Task	FNE5-6	Storage	Fri 11/28/03	Fri 11/28/03
167	Task	FNE5-8	Installation of Equipment	Mon 12/1/03	Fri 12/12/03
168	Task	FNE5-9	Cleanup	Mon 12/15/03	Mon 12/15/03
169	Task	FNE5-9-9	documentation for Dispatch Center	Tue 12/16/03	Tue 12/16/03
170	**Activity**	**FNE6**	**Old City Hall**	**Thu 7/17/03**	**Thu 11/13/03**
171	Task	FNE6-6	Receive and Inventory	Thu 7/17/03	Thu 7/17/03
172	Task	FNE6-7	Storage	Fri 7/18/03	Fri 7/18/03
173	Task	FNE6-8	Installation of Equipment	Wed 11/5/03	Tue 11/11/03
174	Task	FNE6-9	Cleanup	Wed 11/12/03	Wed 11/12/03
175	Task	FNE6-9-9	documentation for Old City Hall	Thu 11/13/03	Thu 11/13/03
176	**Activity**	**FNE7**	**New City Hall**	**Thu 7/17/03**	**Thu 11/20/03**
177	Task	FNE7-7	Receive and Inventory	Thu 7/17/03	Thu 7/17/03
178	Task	FNE7-8	Storage	Fri 7/18/03	Fri 7/18/03
179	Task	FNE7-9	Installation of Equipment	Wed 11/12/03	Tue 11/18/03
180	Task	FNE7-10	Cleanup	Wed 11/19/03	Wed 11/19/03
181	Task	FNE7-10-10	documentation for New City hall	Thu 11/20/03	Thu 11/20/03
182	**Activity**	**FNE8**	**Control Stations**	**Thu 11/27/03**	**Tue 12/30/03**
183	Task	FNE8-8	Receive and Inventory	Thu 11/27/03	Thu 11/27/03
184	Task	FNE8-9	Storage	Fri 11/28/03	Fri 11/28/03
185	Task	FNE8-10	Installation of Equipment	Mon 12/22/03	Fri 12/26/03
186	Task	FNE8-11	Cleanup	Mon 12/29/03	Mon 12/29/03
187	Task	FNE8-11-11	documentation fom control stations	Tue 12/30/03	Tue 12/30/03
188	**Activity**	**ANT 4-4**	**Control Station Antennas**	**Thu 7/17/03**	**Tue 12/16/03**
189	Task	ANT 4-4-4	Receive and Inventory	Thu 7/17/03	Thu 7/17/03
190	Task	ANT 4-4-5	Install	Mon 12/1/03	Fri 12/12/03
191	Task	ANT 4-4-6	Test	Mon 12/15/03	Mon 12/15/03
192	Task	ANT 4-4-7	Document control station antenna	Tue 12/16/03	Tue 12/16/03
193	Milestone	ANT 4-4-8	Antenna System Complete	Tue 12/16/03	Tue 12/16/03
194	**Phase**	**Civil-4**	**75th Reservoir Civil Work**	**Wed 5/14/03**	**Fri 11/28/03**
195	**Activity**	**SitAcq-4**	**Site Acquisition**	**Wed 5/14/03**	**Wed 5/14/03**
196	Milestone	SitAcqCust-4	Customer Approved site	Wed 5/14/03	Wed 5/14/03
197	**Activity**	**CivSitDev-4**	**Site Development- Pre-Zoning**	**Thu 5/15/03**	**Fri 8/29/03**
198	Task	CivPlanZoneMap-4	Obtain planning and zoning maps	Thu 5/15/03	Wed 5/21/03
199	Task	CivSurvey-4	Survey	Thu 5/22/03	Thu 6/5/03
200	Task	CivSoil-4	Soil Analyses	Fri 6/6/03	Thu 6/12/03
201	Task	CivEnv-4	Environmental Study Report	Fri 6/13/03	Thu 6/19/03
202	Task	CivPlotPlan-4	Drainage and Erosion Report	Fri 6/20/03	Thu 6/26/03
203	Task	CivArch-4	A& E Drawings	Fri 6/27/03	Fri 7/25/03
204	Task	CivUtil-4	Electrical Utilities	Mon 7/28/03	Fri 8/1/03
205	Task	CivTel-4	Telco utilities	Mon 8/4/03	Fri 8/15/03
206	Task	CivDoc-4	Planning and Zoning approval	Mon 8/18/03	Fri 8/29/03
207	**Activity**	**CivSitPrep-4**	**Site Preparation- Post Zoning**	**Mon 7/28/03**	**Fri 8/15/03**
208	Task	CivLndPrep-4	Complete site preparation packages	Mon 7/28/03	Fri 8/1/03



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Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

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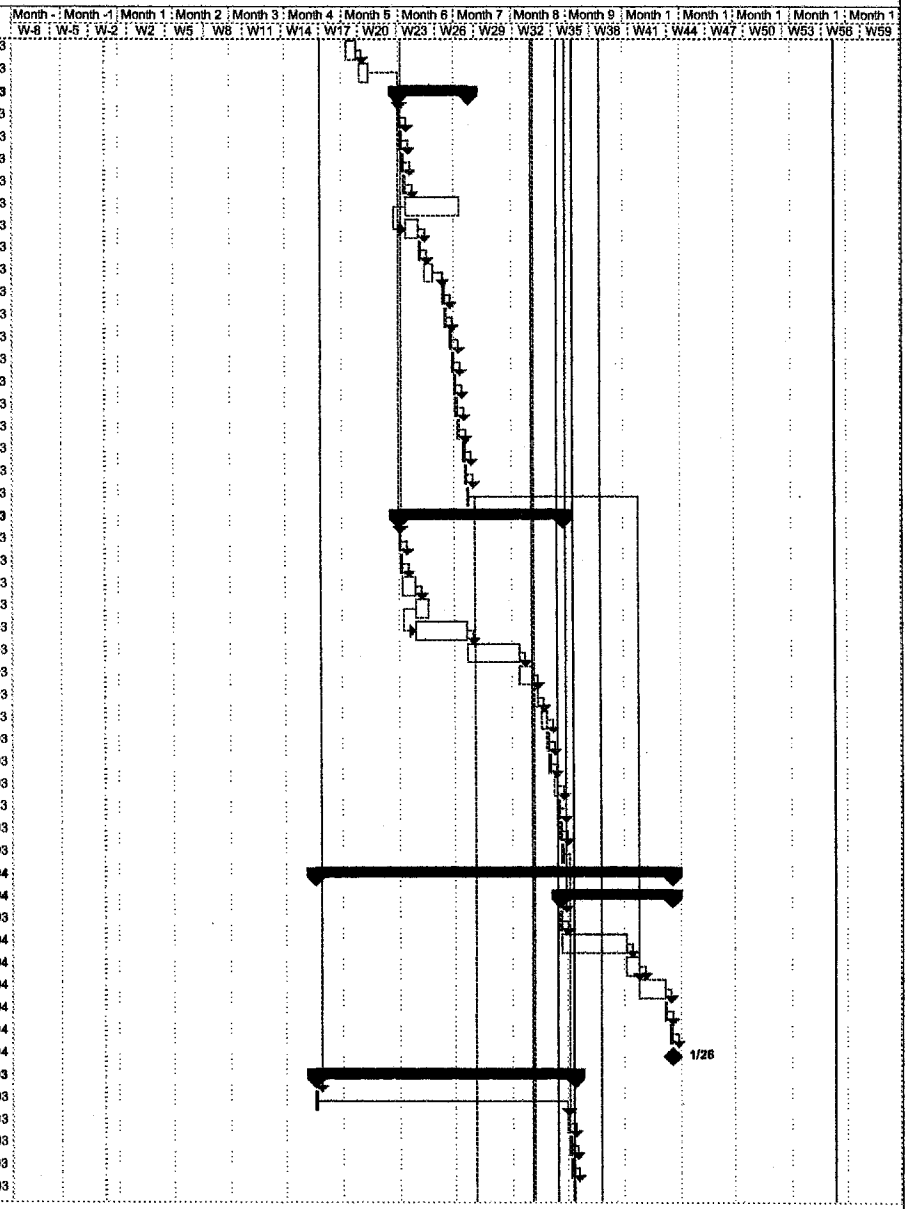
ID	task type	task_ID	Task Name	Start	Finish
209	Task	CivSitPrep-4-4	Contract developer	Mon 8/4/03	Fri 8/8/03
210	Task	CivLndAcc-4	Site prep Acceptance	Mon 8/11/03	Fri 8/15/03
211	**Activity**	**BldCon-4**	**Building Construction**	**Mon 9/1/03**	**Wed 10/8/03**
212	Task	BldCon-4-4	Finalize Equipment room Layout	Mon 9/1/03	Mon 9/1/03
213	Task	BldDes-4	Design Building	Tue 9/2/03	Tue 9/2/03
214	Task	BldPermit-4	Obtain Building Permits	Wed 9/3/03	Wed 9/3/03
215	Task	BldCon-4-5	Order Building	Thu 9/4/03	Thu 9/4/03
216	Task	BldCon-4-6	Manufacture Building	Fri 9/5/03	Fri 10/3/03
217	Task	BldFndCnst-4	Foundation construction	Fri 9/5/03	Thu 9/11/03
218	Task	BldFndInsp-4	Foundation Inspection	Fri 9/12/03	Fri 9/12/03
219	Task	BldConDel-4	Building Construction/Delivery	Mon 9/15/03	Fri 9/19/03
220	Task	BldGrnd-4	Grounding - Ext/Int	Thu 9/25/03	Thu 9/25/03
221	Task	BldElect-4	Electrical Work	Fri 9/26/03	Fri 9/26/03
222	Task	BldHVAC-4	HVAC	Mon 9/29/03	Mon 9/29/03
223	Task	BldUtilHU-4	Utility Hookup	Tue 9/30/03	Tue 9/30/03
224	Task	BldTelco-4	Telco	Wed 10/1/03	Wed 10/1/03
225	Task	BldExtCon-4	External Connections	Thu 10/2/03	Thu 10/2/03
226	Task	BldWrkCom-4	Complete Building work	Fri 10/3/03	Fri 10/3/03
227	Task	BldWrkInsp-4	Building/electrical inspection	Mon 10/6/03	Mon 10/6/03
228	Task	BldDoc-4	Documentation	Tue 10/7/03	Tue 10/7/03
229	Task	BldSiteAcc-4	Site acceptance	Wed 10/8/03	Wed 10/8/03
230	**Activity**	**TowConst-4**	**Tower Construction**	**Mon 9/1/03**	**Fri 11/28/03**
231	Task	TowCnstEng-4	Tower Engineering	Mon 9/1/03	Mon 9/1/03
232	Task	TowCnstPermit-4	Obtain permits for tower	Tue 9/2/03	Tue 9/2/03
233	Task	TowCnstPermit-4-1	Tower foundation Construction	Wed 9/3/03	Tue 9/9/03
234	Task	TowCnstPermit-4-2	Foundation inspection	Wed 9/10/03	Tue 9/16/03
235	Task	TowCnstOrd-4	Order Tower	Wed 9/10/03	Tue 10/7/03
236	Task	TowCnstMan-4	Manufacture Tower	Wed 10/8/03	Tue 11/4/03
237	Task	TowCnstShip-4	Ship Tower	Wed 11/5/03	Tue 11/11/03
238	Task	TowCnsAssem-4	Assemble and Erect towers	Wed 11/12/03	Fri 11/14/03
239	Task	TowCnstGrd-4	Tower Grounding/Protection	Mon 11/17/03	Wed 11/19/03
240	Task	TowCnstLit-4	Tower Lighting	Thu 11/20/03	Thu 11/20/03
241	Task	TowCnstPnt-4	Diesel Tank Filled	Fri 11/21/03	Fri 11/21/03
242	Task	TowCnstFnc-4	Fencing	Mon 11/24/03	Tue 11/25/03
243	Task	TowCnstClnup-4	Site Clean-up	Wed 11/26/03	Wed 11/26/03
244	Task	TowCnstDoc-4	Documentation	Thu 11/27/03	Thu 11/27/03
245	Task	TowCnstInsp-4	Inspect towers	Fri 11/28/03	Fri 11/28/03
246	**Phase**	**Site 4**	**Reservoir Installation**	**Thu 7/17/03**	**Mon 1/26/04**
247	**Activity**	**FNE 4**	**FNE Installation**	**Thu 11/27/03**	**Mon 1/26/04**
248	Task	FNERxInv 4	Receive and inventory	Thu 11/27/03	Thu 11/27/03
249	Task	FNEStor 4	Storage	Fri 11/28/03	Thu 1/1/04
250	Task	FNEStor 4-4	Electrical Service established	Fri 1/2/04	Thu 1/8/04
251	Task	FNEVc 4	Installation Voice	Fri 1/9/04	Thu 1/22/04
252	Task	FNEClnup 4	Power Up	Fri 1/23/04	Fri 1/23/04
253	Task	FNEDoc 4	Documentation	Mon 1/26/04	Mon 1/26/04
254	Milestone	FNECpt 4	FNE Installation Complete	Mon 1/26/04	Mon 1/26/04
255	**Activity**	**Ant 4**	**Antenna System Installation**	**Thu 7/17/03**	**Thu 12/4/03**
256	Task	ANT 4-4-4	Receive and Inventory	Thu 7/17/03	Thu 7/17/03
257	Task	ANT 4-4-5	Install	Mon 12/1/03	Mon 12/1/03
258	Task	ANT 4-4-6	Test	Tue 12/2/03	Tue 12/2/03
259	Task	ANT 4-4-7	Document control station antenna	Wed 12/3/03	Wed 12/3/03
260	Milestone	AntCpt 4	Antenna System Complete	Thu 12/4/03	Thu 12/4/03



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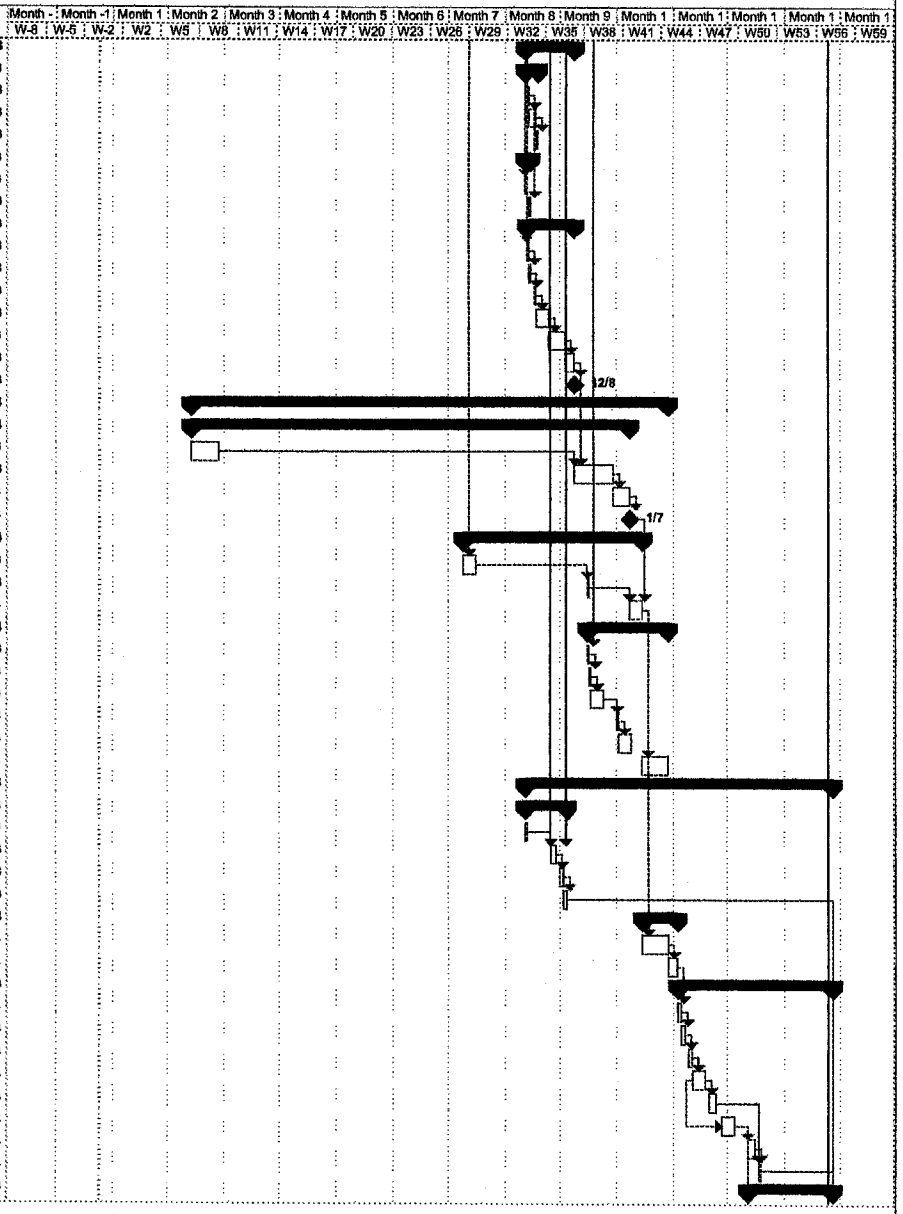
Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

Proposed City Of Miami Beach Timeline

ID	task type	task ID	Task Name	Start	Finish
261	**Phase**	**MW 4**	**Microwave Installation**	**Wed 11/12/03**	**Mon 12/8/03**
262	**Activity**	**MW 4-4-4**	**Lagorce**	**Wed 11/12/03**	**Tue 11/18/03**
263	Task	MW 4-4-4-4	Move MW equip to Reservoir site	Wed 11/12/03	Thu 11/13/03
264	Task	MW 4-4-4-5	Remove antennas	Fri 11/14/03	Mon 11/17/03
265	Task	MW 4-4-4-6	Cleanup Site	Tue 11/18/03	Tue 11/18/03
266	**Activity**	**MW 4-4-4-10**	**Tower 41**	**Wed 11/12/03**	**Fri 11/14/03**
267	Task	MW 4-4-4-10-10	Receive and Inventory	Wed 11/12/03	Wed 11/12/03
268	Task	MW 4-4-4-10-11	Re-align Site	Fri 11/14/03	Fri 11/14/03
269	**Activity**	**MW 4-4**	**Reservoir site**	**Thu 11/13/03**	**Mon 12/8/03**
270	Task	MWRxInv 4	Receive and Inventory	Thu 11/13/03	Thu 11/13/03
271	Task	MWStor 4	Storage	Fri 11/14/03	Fri 11/14/03
272	Task	MWAnt 4	Install antenna and line	Mon 11/17/03	Mon 11/17/03
273	Task	MWRad 4	Install radios	Tue 11/18/03	Mon 11/24/03
274	Task	MWMux 4	Install multiplex	Tue 11/25/03	Wed 12/3/03
275	Task	MWPathOpt 4	Path optimization	Thu 12/4/03	Mon 12/8/03
276	Milestone	MWCpt 4	Microwave Complete	Mon 12/8/03	Mon 12/8/03
277	**Phase**	**SysOpt**	**System Optimization**	**Wed 5/14/03**	**Wed 1/28/04**
278	**Activity**	**SysOptAll**	**Optimize System**	**Wed 5/14/03**	**Wed 1/7/04**
279	Task	SysOptAll-0	Baseline Existing System - noise floor	Wed 5/14/03	Wed 5/28/03
280	Task	SysOptFNE	System FNE	Tue 12/9/03	Mon 12/29/03
281	Task	ProgOptDisp	Dispatch Center	Tue 12/30/03	Wed 1/7/04
282	Milestone	ProgOptAcc	System	Wed 1/7/04	Wed 1/7/04
283	**Activity**	**Cutover**	**Cut-Over**	**Thu 10/9/03**	**Wed 1/14/04**
284	Task	CutOverPln	Planning	Thu 10/9/03	Wed 10/15/03
285	Task	CutOverCust	Customer Agreement	Tue 12/16/03	Tue 12/16/03
286	Task	CutoverPerf	Perform Cut-over	Thu 1/8/04	Wed 1/14/04
287	**Activity**	**Trng**	**Training**	**Tue 12/16/03**	**Wed 1/28/04**
288	Task	TrngDev	Developing the training plan	Tue 12/16/03	Tue 12/16/03
289	Task	TrngCont	Contract for training	Wed 12/17/03	Wed 12/17/03
290	Task	TrngMatDev	Develop training material	Thu 12/18/03	Wed 12/24/03
291	Task	TrngSched	Schedule training	Thu 1/1/04	Thu 1/1/04
292	Task	TrngSystem	System training (WLS)	Fri 1/2/04	Thu 1/8/04
293	Task	TrngPerf	Perform training	Thu 1/15/04	Wed 1/28/04
294	**Phase**	**ATP**	**Acceptance Test**	**Wed 11/12/03**	**Mon 4/26/04**
295	**Activity**	**ATPR56**	**Quality Audit**	**Wed 11/12/03**	**Thu 12/4/03**
296	Task	ATPR56Cnt	Control Sites	Wed 11/12/03	Wed 11/12/03
297	Task	ATPR56RF	RF Sites	Wed 11/26/03	Fri 11/28/03
298	Task	ATPR56CNSL	Console Locations	Mon 12/1/03	Tue 12/2/03
299	Task	ATPR56PL	Punchlist Resolution	Wed 12/3/03	Thu 12/4/03
300	**Activity**	**ATPEqp**	**Equipment**	**Thu 1/15/04**	**Mon 2/2/04**
301	Task	ATPEqpFNE	FNE	Thu 1/15/04	Wed 1/28/04
302	Task	ATPLnkVer	Link Verification	Thu 1/29/04	Mon 2/2/04
303	**Activity**	**ATPCov**	**Coverage**	**Tue 2/3/04**	**Mon 4/26/04**
304	Task	ATPCovEqp	Secure and Configure Test Sets	Tue 2/3/04	Wed 2/4/04
305	Task	ATPCovProc	Generate CATP procedures	Thu 2/5/04	Fri 2/6/04
306	Task	ATPCovMps	Generate grid maps	Mon 2/9/04	Tue 2/10/04
307	Task	ATPCovATP	Run CATP	Wed 2/11/04	Tue 2/17/04
308	Task	ATPCovDoc	Document CATP results	Fri 2/20/04	Mon 2/23/04
309	Task	ATPFcnSys-0	Manual DAQ test	Fri 2/27/04	Thu 3/4/04
310	Task	ATPDoc	Document test results	Fri 3/12/04	Mon 3/15/04
311	Milestone	ATPAcc	SATP Acceptance	Thu 3/18/04	Thu 3/18/04
312	**Activity**	**EMIRFI**	**BDA Analysis**	**Fri 3/12/04**	**Mon 4/26/04**

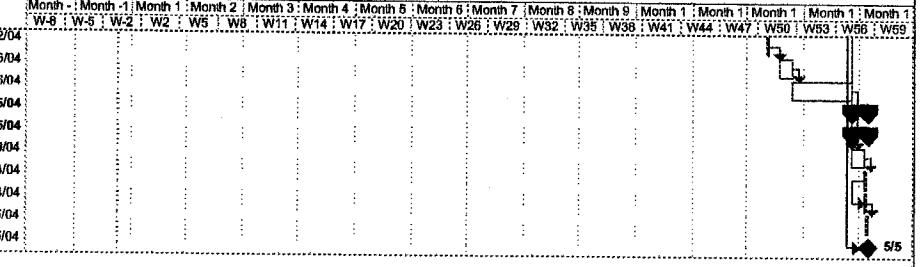


Project: City Of Miami Beach
Project Manager : Mark A. Cabra
Updated : Mon 3/24/03

Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

Proposed City Of Miami Beach Timeline

ID	task type	task ID	Task Name	Start	Finish
313	Task	EmiAnal-0-1	BDA analysis	Fri 3/12/04	Fri 3/12/04
314	Task	EmiAnal-0	BDA Work	Fri 3/19/04	Thu 3/25/04
315	Task	ATPCov30d	thirty day test	Fri 3/26/04	Mon 4/26/04
316	**Phase**	**Final**	**Finalize**	**Tue 4/27/04**	**Wed 5/5/04**
317	**Activity**	**FnlContitm**	**Contract Items**	**Tue 4/27/04**	**Wed 5/5/04**
318	Task	FnlPunRes	Punchlist Resolution	Tue 4/27/04	Mon 5/3/04
319	Task	FnlSerTran	Service Transition/PTC	Tue 5/4/04	Tue 5/4/04
320	Task	FnlSysManu-0	System Documentation	Tue 5/4/04	Tue 5/4/04
321	Task	FnlSysManu	System Manual	Wed 5/5/04	Wed 5/5/04
322	Milestone	FnlAccpt	**Final Acceptance**	Wed 5/5/04	Wed 5/5/04



Project: City Of Miami Beach
Project Manager : Mark A. Cabra
Updated : Mon 3/24/03

Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

Exhibit E **Equipment List**

Exhibit E

Equipment List

Equipment List and Pricing
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Qty	Nomenclature	Description	Unit Price	Extended Total
	Miami Beach Prime Site			
1	SQM01SUM0090	REDUNDANT ZONE CONTROLLER	$62,050.00	$62,050.00
1	D802AG	ENH: SOFTWARE, ASTRO SYSTEM	$61,200.00	$61,200.00
1	ZA00075AB	ENH: SITE LICENSE	$850.00	$850.00
1	DQB090500GWA	UPS, 3KVA/2100W AXXIUM RACKMOUNT, 1	$3,310.00	$3,310.00
1	T6719	120VAC STAND-ALONE UNATTENDED SHUTD	$7,512.00	$7,512.00
1	SQM01SUM0105	ASTRO SINGLE/MULTI ZONE APPLICATION	$132,600.00	$132,600.00
1	T6586	ZONE LEVEL SEVERS	$30,600.00	$30,600.00
1	CA00127AA	ADD: USER CONFIGURATION SUBSYSTEM H	$14,450.00	$14,450.00
1	CA00132AA	ENH: CABINET	$1,908.00	$1,908.00
1	CA00139AA	ENH: 4.1 FULLVISION SERVER	$20,400.00	$20,400.00
1	D52AG	ENH: ZW GRID & CONTROL DISPLAY USER	$17,000.00	$17,000.00
1	D699AH	ENH: DYNAMIC REGROUPING CAPABILITY	$2,550.00	$2,550.00
1	D802AN	ENH: DIGITAL OPERATION	$8,500.00	$8,500.00
1	D980AN	ENH: CADI SOFTWARE OPTION	$18,700.00	$18,700.00
1	DA00148AE	ENH: ZONE HISTORICAL REPORTS USER	$4,250.00	$4,250.00
1	Z08AA	ENH: SNMP TRAP FORWARDING	$6,800.00	$6,800.00
1	Z13AC	ENH: CONFIG MANAGEMENT USER/REPORT	$2,975.00	$2,975.00
1	Z375AE	ENH: 4 SITES	$17,850.00	$17,850.00
2	Z800AF	ENH: 1000 RADIO USER	$2,550.00	$5,100.00
1	Z801AG	ENH: BASIC RADIO CONTROL MANAGER US	$5,950.00	$5,950.00
1	ZA00104AA	ADD: TECHNICAL ASSISTANCE, FORTY HO	$10,200.00	$10,200.00
1	ZA00149AB	ENH: ZONE DYNAMIC REPORTS USER	$6,800.00	$6,800.00
1	ZA00151AE	ENH: AFFFILIATION USER	$5,950.00	$5,950.00
1	ZA00180AA	ENH: SOFTWARE MOSCAD INTERFACE	$2,550.00	$2,550.00
1	ZA00187AA	ENH: HP OV 6.1 250 UNLIMITED	$19,550.00	$19,550.00
1	ZA00235AA	ENH: 9000 OPEN MANANGEMENT SYSTEM V	$7,650.00	$7,650.00
1	T6713	USER CONFIGURATION SERVER	$14,450.00	$14,450.00
1	D52AE	ENH: ZONE WATCH CAPABILITY	$8,500.00	$8,500.00
1	D699AH	ENH: DYNAMIC REGROUPING CAPABILITY	$2,550.00	$2,550.00
1	D802AE	ENH: OL APCO 25 DIGITAL OPER	$8,500.00	$8,500.00
1	D980AK	ENH: CADI CAPABILITY	$30,600.00	$30,600.00
1	DA00148AC	ENH: SYSTEM HISTORICAL REPORTS	$8,500.00	$8,500.00
1	Z801AE	ENH: RADIO CONTROL MANAGER CAPABILI	$11,900.00	$11,900.00
1	Z802AE	ENH: UCS CONFIGURATION USER/REPORTS	$21,250.00	$21,250.00
3	L3142	HP MINITOWER	$1,472.00	$4,416.00
3	ZA00173AA	ENH: SOFTWARE, CRYSTAL REPORTS	$470.00	$1,410.00
3	ZA00259AA	ENH: 17 INCH MONITOR OPTION SITE LE	$2,328.00	$6,984.00
3	T6516	NETWORK MANAGER CLIENT SOFTWARE	$425.00	$1,275.00
2	DSJ4813A	HP PROCURVE SWITCH 2524	$1,081.00	$2,162.00
1	DSJ4116A	HP PROCURVE SWITCH GIGABIT STACKING	$200.00	$200.00
1	DDN6068	MAXSERVER 4, 4MB RAM	$1,294.00	$1,294.00
2	L3170	PARADYNE 3810 S/A MODEM V.32	$809.00	$1,618.00
2	DQTORK118556	SR001 RACKMOUNT W/ 2 TELCO 16 RJ-45	$170.00	$340.00
1	DDN6070	MAXSERVER 20, 4MB RAM	$3,056.00	$3,056.00
1	DLN6487	COLOR LASER PRINTER (110V) HP4550	$4,165.00	$4,165.00
1	DQRM110A	RACK NEST 2/14	$690.00	$690.00
6	DQMT651C	T1/E1 FIBER OPTIC LINE DRIVER	$1,064.00	$6,384.00
1	DQRM110A	RACK NEST 2/14	$690.00	$690.00
5	DQMT651C	T1/E1 FIBER OPTIC LINE DRIVER	$1,064.00	$5,320.00
1	SQM01SUM0066	MTC 3600 SZ REM SIMUL PRIME	$65,450.00	$65,450.00
1	D179CD	ADD: MTC 3600 SIMUL PRIM SPARE	$16,630.00	$16,630.00
1	D275AK	ADD: REDUNDANT POWER SUPPLY	$706.00	$706.00
1	D313	ADD: CONSOLE INTERFACE SPARE BOARDS	$3,086.00	$3,086.00
1	D389	ADD: REDUNDANT CONTROLLER INTERFACE	$2,315.00	$2,315.00
1	D391AP	ADD: 7 CHANNELS (14 CH CTY)	$6,460.00	$6,460.00
1	D396AE	ADD: MTC 3600 OPERATIONS AND SERVIC	$64.00	$64.00
1	D396AJ	ADD: MTC 3600 OPERATIONS AND SERVIC	$1,086.00	$1,086.00
1	D396AP	ADD: MANUAL, MTC 3600 SMARTZONE SIM	$288.00	$288.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	Z389	ADD: ASTRO MIXED MODE OPERATION	$5,483.00	$5,483.00
1	SQM01SUM0066	MTC 3600 SZ REM SIMUL PRIME	$65,450.00	$65,450.00
1	D275AK	ADD: REDUNDANT POWER SUPPLY	$706.00	$706.00
1	D313	ADD: CONSOLE INTERFACE SPARE BOARDS	$3,086.00	$3,086.00
1	D389	ADD: REDUNDANT CONTROLLER INTERFACE	$2,315.00	$2,315.00
1	D391AP	ADD: 7 CHANNELS (14 CH CTY)	$6,460.00	$6,460.00
1	D396AE	ADD: MTC 3600 OPERATIONS AND SERVIC	$64.00	$64.00
1	D396AJ	ADD: MTC 3600 OPERATIONS AND SERVIC	$1,086.00	$1,086.00
1	D396AP	ADD: MANUAL, MTC 3600 SMARTZONE SIM	$288.00	$288.00
1	Z389	ADD: ASTRO MIXED MODE OPERATION	$5,483.00	$5,483.00
6	DSGDTL158AR3	DATA BROADCAST BOX W/DB 25 PIN CONN	$408.00	$2,448.00
6	DQGDTL486	RACKMOUNT BRACKETS	$28.00	$168.00
3	CHN1009	CARDCAGE DIU 3000	$255.00	$765.00
10	F2048	ASTRO DIU3000 HARDWARE	$2,253.00	$22,530.00
10	X806	ENH: ASTRO CAI OPERATION	$0.00	$0.00
10	X960	ADD: TRUNKING RELEASE SW.	$2,678.00	$26,780.00
10	T6721	DIGITAL INTERFACE UNIT CRYPTO MODUL	$213.00	$2,130.00
10	CA00147AA	ADD: BASIC SOFTWARE OPTION	$43.00	$430.00
10	CA00143AB	ADD: DES OFB ENCRYPTION KIT	$638.00	$6,380.00
3	FLN8840	CENTER PANEL DIU3000 CARDCAGE	$21.00	$63.00
2	FLN8841	BLANK PANEL DIU3000	$25.00	$50.00
1	THN1013	RACK 7.5' OPEN	$421.00	$421.00
1	RVN4053	RSS ASTRO DIGITAL INTERFACE UNIT	$244.00	$244.00
1	3080385B23	RSS PROGRAMMING CABLE	$6.00	$6.00
1	5880385B30	ADAPTOR TEST CABLE	$19.00	$19.00
3	6802949C75	MANUAL SERVICE ASTRO DIU3000	$31.00	$93.00
3	6802949C95	MANUAL OWNER DIU TRUNK OPTION	$4.00	$12.00
1	TKN8531C	CABLE, KEYLOAD	$71.00	$71.00
150	L1704	3/8" LDF HELIAX POLY JKT PER FOOT	$2.00	$300.00
2	TDN8812	3/8" CONN PLTD N PLUG MALE	$34.00	$68.00
2	CDN6510	1/2" SURE GROUND	$27.00	$54.00
1	TDN9289	CABLE WRAP WEATHERPROOFING	$36.00	$36.00
1	DSISMR50LNZ6MA	MW COAX PROTECTOR 6VM CONN	$128.00	$128.00
25	L1700	1/4" SUPERFLEX POLY JKT PER FOOT	$2.00	$50.00
1	TDN9714	1/4" CONN N MALE S FLEX PLTD	$28.00	$28.00
1	TDN9716	1/4" CONN N MALE RA PLTD	$39.00	$39.00
2	DSTRAK91008	PRIME/MASTER SITE CONFIG AC POWER	$31,935.00	$63,870.00
1	DQ8188	ETHERNET TIME SERVER	$1,243.00	$1,243.00
1	T5770	ASTRO TAC 3000 COMPARATOR	$3,145.00	$3,145.00
1	X153	ADD: HARDWARE, RACKMOUNT	$0.00	$0.00
1	X225	ADD: 6 WIRELINE I/O PORTS-CAI	$2,550.00	$2,550.00
1	X242	ENH: DIGITAL AND ANALOG OPRN	$2,380.00	$2,380.00
1	X888	ENH: GPS SIMULCAST OPERATION	$2,380.00	$2,380.00
3	X889	ADD: ASTRO V.24 WIRELINE INTERFACE	$425.00	$1,275.00
1	X989	ENH: SZ TRUNKING OPERATION	$3,995.00	$3,995.00
1	T5770	ASTRO TAC 3000 COMPARATOR	$3,145.00	$3,145.00
1	X153	ADD: HARDWARE, RACKMOUNT	$0.00	$0.00
1	X225	ADD: 6 WIRELINE I/O PORTS-CAI	$2,550.00	$2,550.00
1	X242	ENH: DIGITAL AND ANALOG OPRN	$2,380.00	$2,380.00
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1	T5770	ASTRO TAC 3000 COMPARATOR	$3,145.00	$3,145.00
1	X153	ADD: HARDWARE, RACKMOUNT	$0.00	$0.00
1	X225	ADD: 6 WIRELINE I/O PORTS-CAI	$2,550.00	$2,550.00
1	X242	ENH: DIGITAL AND ANALOG OPRN	$2,380.00	$2,380.00
1	X888	ENH: GPS SIMULCAST OPERATION	$2,380.00	$2,380.00
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1	X989	ENH: SZ TRUNKING OPERATION	$3,995.00	$3,995.00
1	T5770	ASTRO TAC 3000 COMPARATOR	$3,145.00	$3,145.00
1	X153	ADD: HARDWARE, RACKMOUNT	$0.00	$0.00

Qty	Nomenclature		Description	Unit Price	Extended Total
1	X225		ADD: 6 WIRELINE I/O PORTS-CAI	$2,550.00	$2,550.00
1	X242		ENH: DIGITAL AND ANALOG OPRN	$2,380.00	$2,380.00
1	X888		ENH: GPS SIMULCAST OPERATION	$2,380.00	$2,380.00
3	X889		ADD: ASTRO V.24 WIRELINE INTERFACE	$425.00	$1,275.00
1	X989		ENH: SZ TRUNKING OPERATION	$3,995.00	$3,995.00
1	T5770		ASTRO TAC 3000 COMPARATOR	$3,145.00	$3,145.00
1	X153		ADD: HARDWARE, RACKMOUNT	$0.00	$0.00
1	X225		ADD: 6 WIRELINE I/O PORTS-CAI	$2,550.00	$2,550.00
1	X242		ENH: DIGITAL AND ANALOG OPRN	$2,380.00	$2,380.00
1	X888		ENH: GPS SIMULCAST OPERATION	$2,380.00	$2,380.00
3	X889		ADD: ASTRO V.24 WIRELINE INTERFACE	$425.00	$1,275.00
1	X989		ENH: SZ TRUNKING OPERATION	$3,995.00	$3,995.00
1	T5770		ASTRO TAC 3000 COMPARATOR	$3,145.00	$3,145.00
1	X153		ADD: HARDWARE, RACKMOUNT	$0.00	$0.00
1	X225		ADD: 6 WIRELINE I/O PORTS-CAI	$2,550.00	$2,550.00
1	X242		ENH: DIGITAL AND ANALOG OPRN	$2,380.00	$2,380.00
1	X888		ENH: GPS SIMULCAST OPERATION	$2,380.00	$2,380.00
3	X889		ADD: ASTRO V.24 WIRELINE INTERFACE	$425.00	$1,275.00
1	X989		ENH: SZ TRUNKING OPERATION	$3,995.00	$3,995.00
1	T5770		ASTRO TAC 3000 COMPARATOR	$3,145.00	$3,145.00
1	X153		ADD: HARDWARE, RACKMOUNT	$0.00	$0.00
1	X225		ADD: 6 WIRELINE I/O PORTS-CAI	$2,550.00	$2,550.00
1	X242		ENH: DIGITAL AND ANALOG OPRN	$2,380.00	$2,380.00
1	X888		ENH: GPS SIMULCAST OPERATION	$2,380.00	$2,380.00
3	X889		ADD: ASTRO V.24 WIRELINE INTERFACE	$425.00	$1,275.00
1	X989		ENH: SZ TRUNKING OPERATION	$3,995.00	$3,995.00
1	T5770		ASTRO TAC 3000 COMPARATOR	$3,145.00	$3,145.00
1	X153		ADD: HARDWARE, RACKMOUNT	$0.00	$0.00
1	X225		ADD: 6 WIRELINE I/O PORTS-CAI	$2,550.00	$2,550.00
1	X242		ENH: DIGITAL AND ANALOG OPRN	$2,380.00	$2,380.00
1	X888		ENH: GPS SIMULCAST OPERATION	$2,380.00	$2,380.00
3	X889		ADD: ASTRO V.24 WIRELINE INTERFACE	$425.00	$1,275.00
1	X989		ENH: SZ TRUNKING OPERATION	$3,995.00	$3,995.00
1	T5770		ASTRO TAC 3000 COMPARATOR	$3,145.00	$3,145.00
1	X153		ADD: HARDWARE, RACKMOUNT	$0.00	$0.00
1	X225		ADD: 6 WIRELINE I/O PORTS-CAI	$2,550.00	$2,550.00
1	X242		ENH: DIGITAL AND ANALOG OPRN	$2,380.00	$2,380.00
1	X888		ENH: GPS SIMULCAST OPERATION	$2,380.00	$2,380.00
3	X889		ADD: ASTRO V.24 WIRELINE INTERFACE	$425.00	$1,275.00
1	X989		ENH: SZ TRUNKING OPERATION	$3,995.00	$3,995.00
1	T5770		ASTRO TAC 3000 COMPARATOR	$3,145.00	$3,145.00
1	X153		ADD: HARDWARE, RACKMOUNT	$0.00	$0.00
1	X225		ADD: 6 WIRELINE I/O PORTS-CAI	$2,550.00	$2,550.00
1	X242		ENH: DIGITAL AND ANALOG OPRN	$2,380.00	$2,380.00
1	X888		ENH: GPS SIMULCAST OPERATION	$2,380.00	$2,380.00
3	X889		ADD: ASTRO V.24 WIRELINE INTERFACE	$425.00	$1,275.00
1	X989		ENH: SZ TRUNKING OPERATION	$3,995.00	$3,995.00
1	X288		ENH: REMOTE RSS	$170.00	$170.00
3	THN1013		RACK 7.5' OPEN	$421.00	$1,263.00
1	CLN1493		FRU WIRELINE BD COMP. CAI FC	$850.00	$850.00
1	CLN1493		FRU WIRELINE BD COMP. CAI FC	$850.00	$850.00
1	CLN1163		FRU V 24 WITH RJ48	$425.00	$425.00
1	TLN3261		FRU 265 WATT AC POWER SUPPLY	$1,530.00	$1,530.00
1	RVN4154		RSS ASTROTAC 3000 COMPARATOR	$244.00	$244.00
1		3.08E+37	PROGRAMMING CABLE	$43.00	$43.00
1	DS58022		FRAME MASTER 20 CHANNEL	$1,569.00	$1,569.00
1	DS58083		POWER ALARM REDUNDANT	$1,265.00	$1,265.00
20	DS58104		SWITCH MODULE A B ONLY	$380.00	$7,600.00
1	DS58044		CONTROL MODULE WITH CONTACT	$1,202.00	$1,202.00
2	DS580330		POWER SUPPLY 115VAC	$1,366.00	$2,732.00
2	DS59522		POWER CABLE 58033 P S 2FT	$129.00	$258.00

Qty	Nomenclature	Description	Unit Price	Extended Total
2	DS58196	POWER CABLE 6.0FT FRAME	$101.00	$202.00
1	CLN1195	SWITCH FOR REDUNDANTTRNK CO	$2,338.00	$2,338.00
1	THN1013	RACK 7.5' OPEN	$421.00	$421.00
1	180302E99	SIGNAL ANALYZER, DYNAMIC	$20,010.00	$20,010.00
1	TTN6113	SHELF FOR DYNAMIC SIG ANALYZER	$170.00	$170.00
1	TTN6110	SIMULCAST ANALYZER DISK 3.5 INCH	$128.00	$128.00
1	T5180	SIMULCAST CONTROLLER I F MODEM	$3,655.00	$3,655.00
1	D567	ADD: SCI EXTENDER CARD	$81.00	$81.00
6	D525	ADD: USCI CONTROLLER INTERFACE	$910.00	$5,460.00
1	T5180	SIMULCAST CONTROLLER I F MODEM	$3,655.00	$3,655.00
5	D525	ADD: USCI CONTROLLER INTERFACE	$910.00	$4,550.00
1	TDF6483	ANTENNA 800 OMNI NFE UNITY GAIN	$403.00	$403.00
150	L1704	3/8" LDF HELIAX POLY JKT PER FOOT	$2.00	$300.00
4	TDN8812	3/8" CONN PLTD N PLUG MALE	$34.00	$136.00
2	CDN6510	1/2" SURE GROUND	$27.00	$54.00
1	TDN9289	CABLE WRAP WEATHERPROOFING	$36.00	$36.00
1	DSISB50LNC2	COAX PROTECTOR	$76.00	$76.00
1	DQ10AMFN20	ATTENUATOR	$136.00	$136.00
50	L1700	1/4" SUPERFLEX POLY JKT PER FOOT	$2.00	$100.00
2	TDN9715	1/4" CONN BNC MALE S FLEX PLTD	$14.00	$28.00
1	M01HX	MCS2000 HIGH SPEC MOBILE	$978.00	$978.00
1	832W	800MHZ 10-15W III	$1,127.00	$1,127.00
1	B665	ADD: CONTROL STATION OPERATION 12-	$293.00	$293.00
1	G24	ENH: EXPRESS SERVICE PLUS PLAN - 2	$49.00	$49.00
1	G325	DEL: ANTENNA NOT REQUIRED	$0.00	$0.00
1	H37	ENH: SFWR SMARTNET SYSTEM	$531.00	$531.00
1	TRN7466	MOUNTING BRACKET EIA 19 INCH	$85.00	$85.00
4	TDF7160	ANTENNA 800 DIPOLE 8.0 DBD	$166.00	$664.00
600	L1704	3/8" LDF HELIAX POLY JKT PER FOOT	$2.00	$1,200.00
8	TDN8812	3/8" CONN PLTD N PLUG MALE	$34.00	$272.00
12	CDN6510	1/2" SURE GROUND	$27.00	$324.00
2	TDN9289	CABLE WRAP WEATHERPROOFING	$36.00	$72.00
4	DSISB50LNC2	COAX PROTECTOR	$76.00	$304.00
4	DQ10AMFN20	ATTENUATOR	$136.00	$544.00
100	L1700	1/4" SUPERFLEX POLY JKT PER FOOT	$2.00	$200.00
8	TDN9714	1/4" CONN N MALE S FLEX PLTD	$28.00	$224.00
4	L99DX	ASTRO SPECTRA	$2,933.00	$11,732.00
4	259L	W7 35 WATTS 806-870 MHZ	$1,063.00	$4,252.00
4	G241	ADD: ANALOG ONLY MODE	$0.00	$0.00
4	G48	ENH: CONVENTIONAL OPERATION	$187.00	$748.00
4	G799	ADD:PRINTED TEST RESULTS	$0.00	$0.00
4	L146	ENH: LOCAL TONE REMOTE	$404.00	$1,616.00
4	W278ACSP	ALT: 15W POWER OUTPUT	$0.00	$0.00
4	TRN7466	MOUNTING BRACKET EIA 19 INCH	$85.00	$340.00
1	THN1013	RACK 7.5' OPEN	$421.00	$421.00
1	DSPREM891830	UNIVERSAL ENCLOSURE TENSR 800	$1,518.00	$1,518.00
2	DSPREM8901	AC POWER SUPPLY 110/220VAC	$886.00	$1,772.00
2	DSPREM880360	CPU 8 T1 E1 BCAST CROSS CONN	$5,971.00	$11,942.00
1	DSPREM892360	8T1 E1 IF CARD 128K WITH MODEM	$3,036.00	$3,036.00
2	DSPREM801060	DUAL T1 E1 WAN CARD	$2,151.00	$4,302.00
1	DSPREM801460	DUAL T1E1 WAN W/ RELAYS 1:N REDUNDA	$2,469.00	$2,469.00
6	DSPREM81130	DSX CEPT PLUG IN MODULE	$633.00	$3,798.00
5	DSPREM816460	4 PORT 4W DSM CARD	$9,614.00	$48,070.00
3	DSPREM822061	10 PORT RS232C SRU	$2,760.00	$8,280.00
1	DSPREM891830	UNIVERSAL ENCLOSURE TENSR 800	$1,518.00	$1,518.00
2	DSPREM8901	AC POWER SUPPLY 110/220VAC	$886.00	$1,772.00
2	DSPREM880360	CPU 8 T1 E1 BCAST CROSS CONN	$5,971.00	$11,942.00
1	DSPREM892360	8T1 E1 IF CARD 128K WITH MODEM	$3,036.00	$3,036.00
2	DSPREM801060	DUAL T1 E1 WAN CARD	$2,151.00	$4,302.00
1	DSPREM801460	DUAL T1E1 WAN W/ RELAYS 1:N REDUNDA	$2,469.00	$2,469.00
6	DSPREM81130	DSX CEPT PLUG IN MODULE	$633.00	$3,798.00

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Qty	Nomenclature	Description	Unit Price	Extended Total
3	DSPREM816460	4 PORT 4W DSM CARD	$9,614.00	$28,842.00
2	DSPREM811960	8 PORT 4W E M TO EXT RANGE CRD	$1,898.00	$3,796.00
3	DSPREM822061	10 PORT RS232C SRU	$2,760.00	$8,280.00
1	DSPREM891830	UNIVERSAL ENCLOSURE TENSR 800	$1,518.00	$1,518.00
2	DSPREM8901	AC POWER SUPPLY 110/220VAC	$886.00	$1,772.00
2	DSPREM880360	CPU 8 T1 E1 BCAST CROSS CONN	$5,971.00	$11,942.00
1	DSPREM892360	8T1 E1 IF CARD 128K WITH MODEM	$3,036.00	$3,036.00
1	DSPREM801060	DUAL T1 E1 WAN CARD	$2,151.00	$2,151.00
1	DSPREM801460	DUAL T1E1 WAN W/ RELAYS 1:N REDUNDA	$2,469.00	$2,469.00
4	DSPREM81130	DSX CEPT PLUG IN MODULE	$633.00	$2,532.00
5	DSPREM811960	8 PORT 4W E M TO EXT RANGE CRD	$1,898.00	$9,490.00
3	DSPREM822061	10 PORT RS232C SRU	$2,760.00	$8,280.00
1	DSPREM887160	ADPCM SERVER CARD	$7,970.00	$7,970.00
1	THN1013	RACK 7.5' OPEN	$421.00	$421.00
1	L3071	MICRON CLIENT PRO CR S P4 1.5GHZ	$4,883.00	$4,883.00
1	L3034	WINDOWS 2000 SERVER (5 USER LIC.)	$1,307.00	$1,307.00
1	CDN1213	HP LASERJET USB	$723.00	$723.00
1	T5823	ROCKETPORT 8 WITH OCTACABLE	$588.00	$588.00
2	FLN6458	CABLE, MODEM 3M W/ADAPTER	$67.00	$134.00
1	DSSQLSERVER2000	SQL SERVER 2000 STD WITH 5 CLIENT A	$2,023.00	$2,023.00
1	L3035	PCANYWHERE32 9.2 WIN/NT	$242.00	$242.00
1	T5807	INTOUCH FOR WINDOWS NT	$12,623.00	$12,623.00
1	F2316	MOSCAD / MOSCAD_L TOOL-BOX	$561.00	$561.00
1	F4516	NFM RTU SITE BUILDER, INCLUDES ELEM	$680.00	$680.00
1	L3071	MICRON CLIENT PRO CR S P4 1.5GHZ	$4,883.00	$4,883.00
1	CDN1213	HP LASERJET USB	$723.00	$723.00
1	L3035	PCANYWHERE32 9.2 WIN/NT	$242.00	$242.00
1	T5739	INTOUCH RUNTIME WITHOUT IO SOFTWARE	$5,376.00	$5,376.00
2	F4300	IP GATEWAY LESS RADIO	$5,498.00	$10,996.00
2	V051	ALT: IP GATEWAY RACKMOUNT	$0.00	$0.00
2	V345	ADD: ASYNC RS232 VIA PORT 3	$153.00	$306.00
1	F4540	NFM RTU WITH I/O 48VDC	$3,570.00	$3,570.00
1	V261	ALT: 110/220V 3A TO 8A	$258.00	$258.00
1	V346	ADD: 120V 3A + 5A/H BAT ON 19I	$561.00	$561.00
1	F4545	NFM RTU MULTIPORT 48VDC	$1,700.00	$1,700.00
1	V426	ADD: NFM CPU	$1,020.00	$1,020.00
1	F6977	MOSCAD ACCESSORY	$0.00	$0.00
1	V186	ADD: RS485 JUNCTION BOX	$81.00	$81.00
2	V440	ADD: RS485 3 METER CABLE	$14.00	$28.00
1	F5999ASP15511	POWER BRIDGE FOR DC DISTRIBUTION, O	$247.00	$247.00
1	F4540	NFM RTU WITH I/O 48VDC	$3,570.00	$3,570.00
1	V261	ALT: 110/220V 3A TO 8A	$258.00	$258.00
1	V346	ADD: 120V 3A + 5A/H BAT ON 19I	$561.00	$561.00
3	F4545	NFM RTU MULTIPORT 48VDC	$1,700.00	$5,100.00
6	V426	ADD: NFM CPU	$1,020.00	$6,120.00
1	F4545	NFM RTU MULTIPORT 48VDC	$1,700.00	$1,700.00
1	F6977	MOSCAD ACCESSORY	$0.00	$0.00
3	V184	ADD: RS232 MULTIPLEXER	$247.00	$741.00
1	V186	ADD: RS485 JUNCTION BOX	$81.00	$81.00
5	V440	ADD: RS485 3 METER CABLE	$14.00	$70.00
1	F5999ASP15511	POWER BRIDGE FOR DC DISTRIBUTION, O	$247.00	$247.00
2	F5999ASP15512	CABLE BASED ON FKN4466A FOR THE CON	$13.00	$26.00
1	9808901C01	Moscad CD Manual	$21.00	$21.00
1	SPQ34BCA0161	GMC DATA BASE GRAPHICS PROGRAMMING	$102.00	$102.00
40	V511BBSP	ADD: SFWR LIC FOR QUANTAR	$51.00	$2,040.00
7	V511BCSP	ADD: SFWR LIC FOR PREM ALARM	$51.00	$357.00
10	V511BFSP	ADD:SFWR LIC FOR ASTROTAC 3000	$51.00	$510.00
11	V511BGSP	ADD: SFWR LIC FOR DIU OR CEB	$51.00	$561.00
4	V511BHSP	ADD: SFWR LIC FOR EFRATOM OR TRAK G	$51.00	$204.00
6	V511BJSP	ADD: SFWR LIC FOR I/O MODULE	$51.00	$306.00
1	V511BRSP	ADD: SFWR LIC PC CLOCK SYNC	$1,700.00	$1,700.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	9808901C76	MOSCAD SERVICE MANUAL ON CD	$34.00	$34.00
1	SPQ34BCA0163	RTU APPLICATION PROGRAMMING	$102.00	$102.00
40	V511DASP	ADD: SFWR LIC QUANTAR REM RSS	$51.00	$2,040.00
40	V511DBSP	ADD: SFWR LIC FOR QUANTAR	$51.00	$2,040.00
7	V511DCSP	ADD: SFWR LIC FOR PREM ALARM	$51.00	$357.00
10	V511DFSP	ADD: SFWR LIC FOR ASTROTAC 3000	$51.00	$510.00
11	V511DGSP	ADD: SFWR LIC FOR DIU OR CEB	$51.00	$561.00
4	V511DHSP	ADD: SFWR LIC FOR EFRATOM OR TRAK G	$51.00	$204.00
6	V511DJSP	ADD: SFWR LIC FOR I/O MODULE	$51.00	$306.00
2	SPQ34BCA0101	DATA ENGLISH SVC IN HOUSE 1 DAY	$1,543.00	$3,086.00
2	SPQ34BCA0101	DATA ENGLISH SVC IN HOUSE 1 DAY	$1,543.00	$3,086.00
11	SPQ34BCA0101	DATA ENGLISH SVC IN HOUSE 1 DAY	$1,543.00	$16,973.00
1	SPQ34BCA0101	DATA ENGLISH SVC IN HOUSE 1 DAY	$1,543.00	$1,543.00
5	SPQ34BCA0101	DATA ENGLISH SVC IN HOUSE 1 DAY	$1,543.00	$7,715.00
2	SPQ34BCA0096	DATA CENTRAL APPLICATION	$1,029.00	$2,058.00
2	V511ADSP	ADD: DEVELOPMENT LABOR 4	$3,086.00	$6,172.00
1	SPQ34BCA0102	DATA ENGLISH SVC IN HOUSE 2 DAY	$3,086.00	$3,086.00
2	SPQ34BCA0115	DATA ENGLISH SVC ONSITE 5 DAY Z1	$11,110.00	$22,220.00
1	SPQ34BCA0113	DATA ENGLISH SVC ONSITE 3 DAY Z1	$7,387.00	$7,387.00
1	SPQ34BCA0111	DATA ENGLISH SVC ONSITE 1 DAY Z1	$3,702.00	$3,702.00
2	DLN6503	SSA UPGRADE, INTOUCH SOFTWARE	$1,913.00	$3,826.00
1	DLN6461	SSA UPGRADE, TOOLBOX	$128.00	$128.00
6	DLN6462	SSA UPGRADE, NFM	$128.00	$768.00
2	DLN6502	SSA UPGRADE, IP GATEWAY	$213.00	$426.00
1	DSAPEXMOV120W	208/120 VAC, 3 PHASE. 50KA MOV.	$2,006.00	$2,006.00
1	DSAPEXMOV120W	208/120 VAC, 3 PHASE. 50KA MOV.	$2,006.00	$2,006.00
1	DSAPEXMOV120W	208/120 VAC, 3 PHASE. 50KA MOV.	$2,006.00	$2,006.00
1	DSAPEX4120WM	208/120 VAC, 3-PHASE. 10KA SADS PRI	$5,015.00	$5,015.00
1	DSAPEX4120WM	208/120 VAC, 3-PHASE. 10KA SADS PRI	$5,015.00	$5,015.00
1	DSAPEX4120WM	208/120 VAC, 3-PHASE. 10KA SADS PRI	$5,015.00	$5,015.00
8	TDF7160	ANTENNA 800 DIPOLE 8.0 DBD	$166.00	$1,328.00
1200	L1704	3/8" LDF HELIAX POLY JKT PER FOOT	$2.00	$2,400.00
16	TDN8812	3/8" CONN PLTD N PLUG MALE	$34.00	$544.00
24	CDN6510	1/2" SURE GROUND	$27.00	$648.00
24	TDN9289	CABLE WRAP WEATHERPROOFING	$36.00	$864.00
1	TDN9588	WALL ROOF FEED THRU PLATE 8 ENTRY	$320.00	$320.00
8	DS204679A16	4" BOOT 4 HOLE 1/2" LDF	$73.00	$584.00
8	DSISB50LNC2	COAX PROTECTOR	$76.00	$608.00
8	DQ10AMFN20	ATTENUATOR	$136.00	$1,088.00
400	L1700	1/4" SUPERFLEX POLY JKT PER FOOT	$2.00	$800.00
16	TDN9714	1/4" CONN N MALE S FLEX PLTD	$28.00	$448.00
8	L99DX	ASTRO SPECTRA	$2,933.00	$23,464.00
8	254L	W9 35 WATTS 806-870 MHZ	$1,366.00	$10,928.00
8	G242	ADD: DIGITAL AND ANALOG MODE	$468.00	$3,744.00
8	G799	ADD:PRINTED TEST RESULTS	$0.00	$0.00
8	W278ACSP	ALT: 15W POWER OUTPUT	$0.00	$0.00
8	TRN7466	MOUNTING BRACKET EIA 19 INCH	$85.00	$680.00
1	DSOP820A	POWER DIST. UNIT SURGE PROTECT	$782.00	$782.00
1	THN1013	RACK 7.5' OPEN	$421.00	$421.00
8	L3223	MC3000 DIGITAL DESKET	$806.00	$6,448.00
8	L3208	DIGITAL JUNCTION BOX	$581.00	$4,648.00
8	ZA00225AA	ADD: CABLE, JUNCTION BOX, ASTRO	$22.00	$176.00
8	BLN7074	HEADSET JACK, COMPACT, GREY	$121.00	$968.00
8	CDN6281AR	HDST MODULE BASE W/PTT SWITCH	$173.00	$1,384.00
8	BLN6732	FOOT, SWITCH TRADITIONAL	$90.00	$720.00
1	DSPREM8901	AC POWER SUPPLY 110/220VAC	$886.00	$886.00
1	DSPREM880460	CPU 2T1 E1 RCON BUS-CONNECT	$3,102.00	$3,102.00
1	DSPREM892360	8T1 E1 IF CARD 128K WITH MODEM	$3,036.00	$3,036.00
1	DSPREM892160	8T1 E1 IF CARD 32K NO MODEM	$2,024.00	$2,024.00
1	DSPREM801460	DUAL T1E1 WAN W/ RELAYS 1:N REDUNDA	$2,469.00	$2,469.00
2	DSPREM81130	DSX CEPT PLUG IN MODULE	$633.00	$1,266.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	DSPREM887160	ADPCM SERVER CARD	$7,970.00	$7,970.00
1	DSPREM816460	4 PORT 4W DSM CARD	$9,614.00	$9,614.00
1	DSPREM811960	8 PORT 4W E M TO EXT RANGE CRD	$1,898.00	$1,898.00
1	DSPREM822061	10 PORT RS232C SRU	$2,760.00	$2,760.00
		PRIME SITE EQUIPMENT TOTAL		**$1,676,573.00**

Qty	Nomenclature	Description	Unit Price	Extended Total
	Miami Beach Fire Station 2			
2	DQBMR10HB1	ANT 13.4 DB GAIN PEANUT	$4,080.00	$8,160.00
2	TDN9383	1/2" X 10' LDF WITH N MALE	$136.00	$272.00
500	L1715	1-5/8" LDF HELIAX POLY JKT PER FT	$17.00	$8,500.00
4	TDN7755	1-5/8" CONNECTOR N JACK PLATED	$316.00	$1,264.00
2	TDN6948	1-1/4" AND 1-5/8" CABLE HOISTING GR	$54.00	$108.00
6	TDN7548	1-5/8" CABLE GROUND CLAMP KIT	$35.00	$210.00
2	TDN9289	CABLE WRAP WEATHERPROOFING	$36.00	$72.00
2	DSISCT50HNB	COAX PROTECTOR	$142.00	$284.00
50	L1709	7/8" LDF HELIAX POLY JKT PER FOOT	$6.00	$300.00
4	DSL5PNMRPC	7/8" CONN N MALE 1 PC CAPTIVATED	$57.00	$228.00
1	TDN9577	7-8 INCH LDF CABLE PRECISION PREP T	$50.00	$50.00
2	DSDB8882A1000	BIDIRECTIONAL SENSOR	$259.00	$518.00
2	DS7390112D05	MULTICOUPLER	$8,096.00	$16,192.00
1	DQBMR10HB1	ANT 13.4 DB GAIN PEANUT	$4,080.00	$4,080.00
1	TDN9383	1/2" X 10' LDF WITH N MALE	$136.00	$136.00
1	DDF1001	16 PORT AUTOQUAD TWR TOP MULTI	$11,706.00	$11,706.00
1	DDF1007	NARROW BAND BASE SELECTOR KIT	$745.00	$745.00
270	L1705	1/2" LDF HELIAX POLY JKT PER FT	$3.00	$810.00
2	DSL4PNMRC	1/2" N MALE RING FLARE CONN	$37.00	$74.00
1	TDN6671	1/2" CABLE HOISTING GRIP	$41.00	$41.00
3	TDN6673	1/2" CABLE GROUND CLAMP KIT	$26.00	$78.00
1	TDN9289	CABLE WRAP WEATHERPROOFING	$36.00	$36.00
1	TDN9575	1/2" CBL PRECISION PREP TOOL	$33.00	$33.00
1	DSISDC50LNZ15	DC INJECTOR 15V	$121.00	$121.00
270	L1705	1/2" LDF HELIAX POLY JKT PER FT	$3.00	$810.00
2	DSL4PNMRC	1/2" N MALE RING FLARE CONN	$37.00	$74.00
1	TDN6671	1/2" CABLE HOISTING GRIP	$41.00	$41.00
3	TDN6673	1/2" CABLE GROUND CLAMP KIT	$26.00	$78.00
1	TDN9289	CABLE WRAP WEATHERPROOFING	$36.00	$36.00
1	DSISDC50LNZ15	DC INJECTOR 15V	$121.00	$121.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X432	ADD: MANUAL, SERVICE	$170.00	$170.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X882	ADD: 7.5' OPEN RACK-QUANTAR, 48RU	$421.00	$421.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X380	ALT: STATION, 2ND FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X381	ALT: STATION, 3RD FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X382	ALT: STATION, 4TH FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X383	ALT: STATION, 5TH FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X384	ALT: STATION, 6TH FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X432	ADD: MANUAL, SERVICE	$170.00	$170.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X882	ADD: 7.5' OPEN RACK-QUANTAR, 48RU	$421.00	$421.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X380	ALT: STATION, 2ND FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X381	ALT: STATION, 3RD FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X382	ALT: STATION, 4TH FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	RVN5002	RSS QUANTAR QUANTRO RECEIVER	$244.00	$244.00
1	3.08E+37	PROGRAMMING CABLE	$43.00	$43.00
1	SQM01SUM0067	MTC 3600 SZ RESC	$24,140.00	$24,140.00
1	D179CE	ADD: MTC 3600 SIMUL REM SPARES	$2,223.00	$2,223.00
1	D275AK	ADD: REDUNDANT POWER SUPPLY	$706.00	$706.00
1	D391AO	ADD: 7 CHANNELS (14 CH CTY)	$6,460.00	$6,460.00
1	D396AP	ADD: MANUAL, MTC 3600 SMARTZONE SIM	$288.00	$288.00
1	Z389	ADD: ASTRO MIXED MODE OPERATION	$5,483.00	$5,483.00
75	L1704	3/8" LDF HELIAX POLY JKT PER FOOT	$2.00	$150.00
2	TDN8812	3/8" CONN PLTD N PLUG MALE	$34.00	$68.00
2	CDN6510	1/2" SURE GROUND	$27.00	$54.00
1	TDN9289	CABLE WRAP WEATHERPROOFING	$36.00	$36.00
1	DSISMR50LNZ6	MICROWAVE COAX PROTECTOR 6V	$122.00	$122.00
25	L1700	1/4" SUPERFLEX POLY JKT PER FOOT	$2.00	$50.00
1	TDN9716	1/4" CONN N MALE RA PLTD	$39.00	$39.00
1	TDN9714	1/4" CONN N MALE S FLEX PLTD	$28.00	$28.00
1	DSTRAK91009	REMOTE SITE CONFIG AC POWER	$27,661.00	$27,661.00

Qty	Nomenclature	Description	Unit Price	Extended Total
2	DSTRAK91061	FOUR PORT DDM	$633.00	$1,266.00
1	DSAPEXMOV120W	208/120 VAC, 3 PHASE. 50KA MOV.	$2,006.00	$2,006.00
1	DSAPEX4120WM	208/120 VAC, 3-PHASE. 10KA SADS PRI	$5,015.00	$5,015.00
1	DSPREM891830	UNIVERSAL ENCLOSURE TENSR 800	$1,518.00	$1,518.00
1	DSPREM8901	AC POWER SUPPLY 110/220VAC	$886.00	$886.00
1	DSPREM880460	CPU 2T1 E1 RCON BUS-CONNECT	$3,102.00	$3,102.00
1	DSPREM892160	8T1 E1 IF CARD 32K NO MODEM	$2,024.00	$2,024.00
1	DSPREM801060	DUAL T1 E1 WAN CARD	$2,151.00	$2,151.00
2	DSPREM81130	DSX CEPT PLUG IN MODULE	$633.00	$1,266.00
3	DSPREM816460	4 PORT 4W DSM CARD	$9,614.00	$28,842.00
2	DSPREM822061	10 PORT RS232C SRU	$2,760.00	$5,520.00
1	THN1013	RACK 7.5' OPEN	$421.00	$421.00
1	F4540	NFM RTU WITH I/O 48VDC	$3,570.00	$3,570.00
1	V261	ALT: 110/220V 3A TO 8A	$258.00	$258.00
1	V346	ADD: 120V 3A + 5A/H BAT ON 19I	$561.00	$561.00
1	F4545	NFM RTU MULTIPORT 48VDC	$1,700.00	$1,700.00
2	V426	ADD: NFM CPU	$1,020.00	$2,040.00
1	F4545	NFM RTU MULTIPORT 48VDC	$1,700.00	$1,700.00
1	F6977	MOSCAD ACCESSORY	$0.00	$0.00
3	V184	ADD: RS232 MULTIPLEXER	$247.00	$741.00
1	V186	ADD: RS485 JUNCTION BOX	$81.00	$81.00
3	V440	ADD: RS485 3 METER CABLE	$14.00	$42.00
1	F5999ASP15511	POWER BRIDGE FOR DC DISTRIBUTION, O	$247.00	$247.00
1	CLN1295	FRU 4 WIRELINE II MODULE	$850.00	$850.00
1	TLN3259	FRU 625 W AC POWER SUPPLY	$1,700.00	$1,700.00
1	TLN3442	FRU 800 100W POWER AMP	$3,145.00	$3,145.00
1	TLN3311B	FRU 800 5V IPA	$1,061.00	$1,061.00
1	TLN3307	FRU 800 EXCITER	$1,020.00	$1,020.00
1	TLN3315	FRU 800 RECEIVER	$1,020.00	$1,020.00
1	CLN1625	FRU EPIC III CONTROL MODULE 60 WATT	$1,700.00	$1,700.00
1	CLN1185	FRU V.24 WIRELINE INTFC	$425.00	$425.00
		FIRE STATION 2 EQUIPMENT TOTAL		**$347,433.00**

Qty	Nomenclature	Description	Unit Price	Extended Total
	Miami Beach Reservoir			
2	DQBMR12OB1	12 DB GAIN OMNI ANTENNA	$7,080.00	$14,160.00
2	TDN9383	1/2" X 10' LDF WITH N MALE	$136.00	$272.00
600	L1715	1-5/8" LDF HELIAX POLY JKT PER FT	$17.00	$10,200.00
4	TDN7755	1-5/8" CONNECTOR N JACK PLATED	$316.00	$1,264.00
2	TDN6948	1-1/4" AND 1-5/8" CABLE HOISTING GR	$54.00	$108.00
6	TDN7548	1-5/8" CABLE GROUND CLAMP KIT	$35.00	$210.00
2	TDN9289	CABLE WRAP WEATHERPROOFING	$36.00	$72.00
2	DSISCT50HNB	COAX PROTECTOR	$142.00	$284.00
50	L1709	7/8" LDF HELIAX POLY JKT PER FOOT	$6.00	$300.00
4	DSL5PNMRPC	7/8" CONN N MALE 1 PC CAPTIVATED	$57.00	$228.00
2	DSDB8882A1000	BIDIRECTIONAL SENSOR	$259.00	$518.00
2	DS7390112D05	MULTICOUPLER	$8,096.00	$16,192.00
1	DQBMR12OB1	12 DB GAIN OMNI ANTENNA	$7,080.00	$7,080.00
1	TDN9383	1/2" X 10' LDF WITH N MALE	$136.00	$136.00
1	DDF1001	16 PORT AUTOQUAD TWR TOP MULTI	$11,706.00	$11,706.00
1	DDF1007	NARROW BAND BASE SELECTOR KIT	$745.00	$745.00
280	L1705	1/2" LDF HELIAX POLY JKT PER FT	$3.00	$840.00
2	TDN8816	1/2" CONNECTOR R A N PLUG LDF PLTD	$64.00	$128.00
1	TDN6671	1/2" CABLE HOISTING GRIP	$41.00	$41.00
3	TDN6673	1/2" CABLE GROUND CLAMP KIT	$26.00	$78.00
4	TDN9289	CABLE WRAP WEATHERPROOFING	$36.00	$144.00
1	DSISDC50LNZ15	DC INJECTOR 15V	$121.00	$121.00
280	L1705	1/2" LDF HELIAX POLY JKT PER FT	$3.00	$840.00
2	TDN8816	1/2" CONNECTOR R A N PLUG LDF PLTD	$64.00	$128.00
1	TDN6671	1/2" CABLE HOISTING GRIP	$41.00	$41.00
3	CDN6511	1/2" SURE GROUND	$33.00	$99.00
4	TDN9289	CABLE WRAP WEATHERPROOFING	$36.00	$144.00
1	DSISDC50LNZ15	DC INJECTOR 15V	$121.00	$121.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X432	ADD: MANUAL, SERVICE	$170.00	$170.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X882	ADD: 7.5' OPEN RACK-QUANTAR, 48RU	$421.00	$421.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X380	ALT: STATION, 2ND FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X381	ALT: STATION, 3RD FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X382	ALT: STATION, 4TH FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	001C	QUANTAR STATION	$0.00	$0.00
1	X383	ALT: STATION, 5TH FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X384	ALT: STATION, 6TH FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X432	ADD: MANUAL, SERVICE	$170.00	$170.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X882	ADD: 7.5' OPEN RACK-QUANTAR, 48RU	$421.00	$421.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X380	ALT: STATION, 2ND FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X381	ALT: STATION, 3RD FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X382	ALT: STATION, 4TH FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	SQM01SUM0067	MTC 3600 SZ RESC	$24,140.00	$24,140.00
1	D275AK	ADD: REDUNDANT POWER SUPPLY	$706.00	$706.00
1	D391AO	ADD: 7 CHANNELS (14 CH CTY)	$6,460.00	$6,460.00
1	D396AP	ADD: MANUAL, MTC 3600 SMARTZONE SIM	$288.00	$288.00
1	Z389	ADD: ASTRO MIXED MODE OPERATION	$5,483.00	$5,483.00
75	L1704	3/8" LDF HELIAX POLY JKT PER FOOT	$2.00	$150.00
4	TDN8812	3/8" CONN PLTD N PLUG MALE	$34.00	$136.00
2	CDN6510	1/2" SURE GROUND	$27.00	$54.00
1	TDN9289	CABLE WRAP WEATHERPROOFING	$36.00	$36.00
1	DSISMR50LNZ6	MICROWAVE COAX PROTECTOR 6V	$122.00	$122.00
25	L1700	1/4" SUPERFLEX POLY JKT PER FOOT	$2.00	$50.00
2	TDN9716	1/4" CONN N MALE RA PLTD	$39.00	$78.00
1	DSTRAK91009	REMOTE SITE CONFIG AC POWER	$27,661.00	$27,661.00
2	DSTRAK91061	FOUR PORT DDM	$633.00	$1,266.00
1	DQ250S2004829R4	250' TOWER	$195,426.00	$195,426.00
1	TT1002	MSB, 12' X 32' CONCRETE BLDG, INCLS	$141,555.00	$141,555.00
1	TT02003AA	ADD: INDOOR GENERATOR (PROVIDES IND	$28,008.00	$28,008.00
1	TT02004AA	ALT: DIESEL GENERATOR	$4,452.00	$4,452.00
1	TT02007AA	ALT: ALT MANUF, ONAN DIESEL GENERAT	$3,887.00	$3,887.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	DSPREM891830	UNIVERSAL ENCLOSURE TENSR 800	$1,518.00	$1,518.00
1	DSPREM8901	AC POWER SUPPLY 110/220VAC	$886.00	$886.00
1	DSPREM880460	CPU 2T1 E1 RCON BUS-CONNECT	$3,102.00	$3,102.00
1	DSPREM892160	8T1 E1 IF CARD 32K NO MODEM	$2,024.00	$2,024.00
1	DSPREM801060	DUAL T1 E1 WAN CARD	$2,151.00	$2,151.00
2	DSPREM81130	DSX CEPT PLUG IN MODULE	$633.00	$1,266.00
3	DSPREM816460	4 PORT 4W DSM CARD	$9,614.00	$28,842.00
2	DSPREM822061	10 PORT RS232C SRU	$2,760.00	$5,520.00
1	THN1013	RACK 7.5' OPEN	$421.00	$421.00
1	F4540	NFM RTU WITH I/O 48VDC	$3,570.00	$3,570.00
1	V261	ALT: 110/220V 3A TO 8A	$258.00	$258.00
1	V346	ADD: 120V 3A + 5A/H BAT ON 19I	$561.00	$561.00
1	F4545	NFM RTU MULTIPORT 48VDC	$1,700.00	$1,700.00
2	V426	ADD: NFM CPU	$1,020.00	$2,040.00
1	F4545	NFM RTU MULTIPORT 48VDC	$1,700.00	$1,700.00
1	F6977	MOSCAD ACCESSORY	$0.00	$0.00
3	V184	ADD: RS232 MULTIPLEXER	$247.00	$741.00
1	V186	ADD: RS485 JUNCTION BOX	$81.00	$81.00
3	V440	ADD: RS485 3 METER CABLE	$14.00	$42.00
1	F5999ASP15511	POWER BRIDGE FOR DC DISTRIBUTION, O	$247.00	$247.00
		75th STREET RESERVOIR EQUIPMENT TOTAL		**$711,410.00**

Qty	Nomenclature	Description	Unit Price	Extended Total
	Miami Beach Rebecca Towers			
1	TDF6483	ANTENNA 800 OMNI NFE UNITY GAIN	$403.00	$403.00
50	L1704	3/8" LDF HELIAX POLY JKT PER FOOT	$2.00	$100.00
4	TDN8812	3/8" CONN PLTD N PLUG MALE	$34.00	$136.00
2	CDN6510	1/2" SURE GROUND	$27.00	$54.00
1	TDN9289	CABLE WRAP WEATHERPROOFING	$36.00	$36.00
1	DSISB50LNC2	COAX PROTECTOR	$76.00	$76.00
1	DQ10AMFN20	ATTENUATOR	$136.00	$136.00
25	L1700	1/4" SUPERFLEX POLY JKT PER FOOT	$2.00	$50.00
2	TDN9714	1/4" CONN N MALE S FLEX PLTD	$28.00	$56.00
1	M01MX	MCS2000 MIDSPEC MOBILE	$438.00	$438.00
1	812W	800MHZ 10-15W I	$664.00	$664.00
1	B665	ADD: CONTROL STATION OPERATION 12-	$293.00	$293.00
1	B71CNST	DEL: STANDARD DESK MICROPHONE	($77.00)	($77.00)
1	G325	DEL: ANTENNA NOT REQUIRED	$0.00	$0.00
1	G397	ENH: EXPRESS SERVICE PLUS (ESP)	$60.00	$60.00
1	H37	ENH: SFWR SMARTNET SYSTEM	$531.00	$531.00
1	TRN7962	RIM II WITH CABLE	$595.00	$595.00
1	THN1013	RACK 7.5' OPEN	$421.00	$421.00
1	6881091C39	MANUALS	$4.00	$4.00
1	6881083C20	MANUAL, SERVICE VOLUME I F/ALL MODE	$46.00	$46.00
1	6881080C43	VOLUME II SERVICE MANUAL - 800 MHZ	$46.00	$46.00
1	6881081C15	RADIO SERVICE SOFTWARE INSTRUCTION	$21.00	$21.00
1	THN1013	RACK 7.5' OPEN	$421.00	$421.00
1	DQ080101BCAISO	MOTOROLA P/N DQ080101BCA (MOD#9170	$18,256.00	$18,256.00
1	DQBMR12OB1	12 DB GAIN OMNI ANTENNA	$7,080.00	$7,080.00
1	TDN9383	1/2" X 10' LDF WITH N MALE	$136.00	$136.00
1	DDF1003	12 PORT PASSIVE QUAD TTA PASS REC	$7,168.00	$7,168.00
1	DDF1007	NARROW BAND BASE SELECTOR KIT	$745.00	$745.00
75	L1705	1/2" LDF HELIAX POLY JKT PER FT	$3.00	$225.00
4	TDN8816	1/2" CONNECTOR R A N PLUG LDF PLTD	$64.00	$256.00
2	TDN6673	1/2" CABLE GROUND CLAMP KIT	$26.00	$52.00
1	TDN9289	CABLE WRAP WEATHERPROOFING	$36.00	$36.00
1	DSISDC50LNZ15	DC INJECTOR 15V	$121.00	$121.00
75	L1705	1/2" LDF HELIAX POLY JKT PER FT	$3.00	$225.00
4	TDN8816	1/2" CONNECTOR R A N PLUG LDF PLTD	$64.00	$256.00
2	CDN6511	1/2" SURE GROUND	$33.00	$66.00
1	TDN9289	CABLE WRAP WEATHERPROOFING	$36.00	$36.00
1	DSISDC50LNZ15	DC INJECTOR 15V	$121.00	$121.00
1	T5589	ASTRO TAC SATELLITE RECEIVER	$2,338.00	$2,338.00
1	X144	ALT: WIRELINE INTERFACE 8 WR	$170.00	$170.00
1	X317	ADD: TUNING SCREW COVERS	$0.00	$0.00
1	X600	ADD: RECEIVER, SATELLITE, 800 MHZ	$1,356.00	$1,356.00
1	X882	ADD: 7.5' OPEN RACK-QUANTAR, 48RU	$421.00	$421.00
1	X897 C	ENH: SZ6809 ASTR CAI TRK RCVR	$1,020.00	$1,020.00
1	T5589	ASTRO TAC SATELLITE RECEIVER	$2,338.00	$2,338.00
1	X144	ALT: WIRELINE INTERFACE 8 WR	$170.00	$170.00
1	X317	ADD: TUNING SCREW COVERS	$0.00	$0.00
1	X380	ALT: STATION, 2ND FROM BOTTOM	$0.00	$0.00
1	X600	ADD: RECEIVER, SATELLITE, 800 MHZ	$1,356.00	$1,356.00
1	X897 C	ENH: SZ6809 ASTR CAI TRK RCVR	$1,020.00	$1,020.00
1	T5589	ASTRO TAC SATELLITE RECEIVER	$2,338.00	$2,338.00
1	X144	ALT: WIRELINE INTERFACE 8 WR	$170.00	$170.00
1	X317	ADD: TUNING SCREW COVERS	$0.00	$0.00
1	X381	ALT: STATION, 3RD FROM BOTTOM	$0.00	$0.00
1	X600	ADD: RECEIVER, SATELLITE, 800 MHZ	$1,356.00	$1,356.00
1	X897 C	ENH: SZ6809 ASTR CAI TRK RCVR	$1,020.00	$1,020.00
1	T5589	ASTRO TAC SATELLITE RECEIVER	$2,338.00	$2,338.00
1	X144	ALT: WIRELINE INTERFACE 8 WR	$170.00	$170.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	X317	ADD: TUNING SCREW COVERS	$0.00	$0.00
1	X382	ALT: STATION, 4TH FROM BOTTOM	$0.00	$0.00
1	X600	ADD: RECEIVER, SATELLITE, 800 MHZ	$1,356.00	$1,356.00
1	X897 C	ENH: SZ6809 ASTR CAI TRK RCVR	$1,020.00	$1,020.00
1	T5589	ASTRO TAC SATELLITE RECEIVER	$2,338.00	$2,338.00
1	X144	ALT: WIRELINE INTERFACE 8 WR	$170.00	$170.00
1	X317	ADD: TUNING SCREW COVERS	$0.00	$0.00
1	X383	ALT: STATION, 5TH FROM BOTTOM	$0.00	$0.00
1	X600	ADD: RECEIVER, SATELLITE, 800 MHZ	$1,356.00	$1,356.00
1	X897 C	ENH: SZ6809 ASTR CAI TRK RCVR	$1,020.00	$1,020.00
1	T5589	ASTRO TAC SATELLITE RECEIVER	$2,338.00	$2,338.00
1	X144	ALT: WIRELINE INTERFACE 8 WR	$170.00	$170.00
1	X317	ADD: TUNING SCREW COVERS	$0.00	$0.00
1	X384	ALT: STATION, 6TH FROM BOTTOM	$0.00	$0.00
1	X600	ADD: RECEIVER, SATELLITE, 800 MHZ	$1,356.00	$1,356.00
1	X897 C	ENH: SZ6809 ASTR CAI TRK RCVR	$1,020.00	$1,020.00
1	T5589	ASTRO TAC SATELLITE RECEIVER	$2,338.00	$2,338.00
1	X144	ALT: WIRELINE INTERFACE 8 WR	$170.00	$170.00
1	X317	ADD: TUNING SCREW COVERS	$0.00	$0.00
1	X600	ADD: RECEIVER, SATELLITE, 800 MHZ	$1,356.00	$1,356.00
1	X882	ADD: 7.5' OPEN RACK-QUANTAR, 48RU	$421.00	$421.00
1	X897 C	ENH: SZ6809 ASTR CAI TRK RCVR	$1,020.00	$1,020.00
1	T5589	ASTRO TAC SATELLITE RECEIVER	$2,338.00	$2,338.00
1	X144	ALT: WIRELINE INTERFACE 8 WR	$170.00	$170.00
1	X317	ADD: TUNING SCREW COVERS	$0.00	$0.00
1	X380	ALT: STATION, 2ND FROM BOTTOM	$0.00	$0.00
1	X600	ADD: RECEIVER, SATELLITE, 800 MHZ	$1,356.00	$1,356.00
1	X897 C	ENH: SZ6809 ASTR CAI TRK RCVR	$1,020.00	$1,020.00
1	T5589	ASTRO TAC SATELLITE RECEIVER	$2,338.00	$2,338.00
1	X144	ALT: WIRELINE INTERFACE 8 WR	$170.00	$170.00
1	X317	ADD: TUNING SCREW COVERS	$0.00	$0.00
1	X381	ALT: STATION, 3RD FROM BOTTOM	$0.00	$0.00
1	X600	ADD: RECEIVER, SATELLITE, 800 MHZ	$1,356.00	$1,356.00
1	X897 C	ENH: SZ6809 ASTR CAI TRK RCVR	$1,020.00	$1,020.00
1	T5589	ASTRO TAC SATELLITE RECEIVER	$2,338.00	$2,338.00
1	X144	ALT: WIRELINE INTERFACE 8 WR	$170.00	$170.00
1	X317	ADD: TUNING SCREW COVERS	$0.00	$0.00
1	X382	ALT: STATION, 4TH FROM BOTTOM	$0.00	$0.00
1	X600	ADD: RECEIVER, SATELLITE, 800 MHZ	$1,356.00	$1,356.00
1	X897 C	ENH: SZ6809 ASTR CAI TRK RCVR	$1,020.00	$1,020.00
1	TLN3315	FRU 800 RECEIVER	$1,020.00	$1,020.00
1	CLN1273	ASTROTAC RECEIVER EPIC CTL MOD	$1,700.00	$1,700.00
1	CLN1303	FRU ASTROTAC RECEIVER WL POWER SUPP	$1,190.00	$1,190.00
3	6.88E+91	MAN INSTR ASTROTAC RCVR FUNCT	$44.00	$132.00
1	THN1013	RACK 7.5' OPEN	$421.00	$421.00
1	SQM01SUM0067	MTC 3600 SZ RESC	$24,140.00	$24,140.00
1	D275AK	ADD: REDUNDANT POWER SUPPLY	$706.00	$706.00
1	D391AO	ADD: 7 CHANNELS (14 CH CTY)	$6,460.00	$6,460.00
1	D396AP	ADD: MANUAL, MTC 3600 SMARTZONE SIM	$288.00	$288.00
1	Z389	ADD: ASTRO MIXED MODE OPERATION	$5,483.00	$5,483.00
1	DSAPEXMOV120W	208/120 VAC, 3 PHASE. 50KA MOV.	$2,006.00	$2,006.00
1	DSAPEX4120WM	208/120 VAC, 3-PHASE. 10KA SADS PRI	$5,015.00	$5,015.00
1	DSPREM891830	UNIVERSAL ENCLOSURE TENSR 800	$1,518.00	$1,518.00
1	DSPREM8901	AC POWER SUPPLY 110/220VAC	$886.00	$886.00
1	DSPREM880460	CPU 2T1 E1 RCON BUS-CONNECT	$3,102.00	$3,102.00
1	DSPREM892160	8T1 E1 IF CARD 32K NO MODEM	$2,024.00	$2,024.00
1	DSPREM801060	DUAL T1 E1 WAN CARD	$2,151.00	$2,151.00
2	DSPREM81130	DSX CEPT PLUG IN MODULE	$633.00	$1,266.00
2	DSPREM811960	8 PORT 4W E M TO EXT RANGE CRD	$1,898.00	$3,796.00
2	DSPREM822061	10 PORT RS232C SRU	$2,760.00	$5,520.00
1	THN1013	RACK 7.5' OPEN	$421.00	$421.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	F4540	NFM RTU WITH I/O 48VDC	$3,570.00	$3,570.00
1	V261	ALT: 110/220V 3A TO 8A	$258.00	$258.00
1	V346	ADD: 120V 3A + 5A/H BAT ON 19I	$561.00	$561.00
1	F4545	NFM RTU MULTIPORT 48VDC	$1,700.00	$1,700.00
1	V426	ADD: NFM CPU	$1,020.00	$1,020.00
1	F6977	MOSCAD ACCESSORY	$0.00	$0.00
3	V184	ADD: RS232 MULTIPLEXER	$247.00	$741.00
1	V186	ADD: RS485 JUNCTION BOX	$81.00	$81.00
2	V440	ADD: RS485 3 METER CABLE	$14.00	$28.00
1	F5999ASP15511	POWER BRIDGE FOR DC DISTRIBUTION, O	$247.00	$247.00
		REBECCA TOWERS EQUIPMENT TOTAL		$166,422.00

Qty	Nomenclature	Description	Unit Price	Extended Total
	Miami Beach Tower 41			
1	TDF6483	ANTENNA 800 OMNI NFE UNITY GAIN	$403.00	$403.00
2	DQBMR12HB1	ANT 15.4DB PEANUT 806-869	$7,253.00	$14,506.00
1	TDN8413A	1/2" X 6' LDF JUMPER WITH NP NJ	$132.00	$132.00
200	L1713	1-1/4" LDF HELIAX POLY JKT PER FT	$12.00	$2,400.00
4	TDN7753	1-1/4" CONNECTOR N JACK PLATED	$188.00	$752.00
2	TDN9581	1-1/4" CABLE BOOT FOR WALL ROOF PLA	$73.00	$146.00
6	CDN6513	1-1/4" SURE GROUND	$33.00	$198.00
2	TDN9289	CABLE WRAP WEATHERPROOFING	$36.00	$72.00
2	DSISCT50HNB	COAX PROTECTOR	$142.00	$284.00
50	L1705	1/2" LDF HELIAX POLY JKT PER FT	$3.00	$150.00
4	TDN8814	1/2" CONNECTOR N PLUG LDF PLTD	$46.00	$184.00
2	DSDB8882A1000	BIDIRECTIONAL SENSOR	$259.00	$518.00
2	DS7390112D05	MULTICOUPLER	$8,096.00	$16,192.00
1	DQBMR10HB1	ANT 13.4 DB GAIN PEANUT	$4,080.00	$4,080.00
1	TDN9383	1/2" X 10' LDF WITH N MALE	$136.00	$136.00
1	DDF1003	12 PORT PASSIVE QUAD TTA PASS REC	$7,168.00	$7,168.00
1	DDF1007	NARROW BAND BASE SELECTOR KIT	$745.00	$745.00
75	L1704	3/8" LDF HELIAX POLY JKT PER FOOT	$2.00	$150.00
4	TDN8812	3/8" CONN PLTD N PLUG MALE	$34.00	$136.00
2	TDN6673	1/2" CABLE GROUND CLAMP KIT	$26.00	$52.00
1	TDN9289	CABLE WRAP WEATHERPROOFING	$36.00	$36.00
1	DSISDC50LNZ15	DC INJECTOR 15V	$121.00	$121.00
75	L1704	3/8" LDF HELIAX POLY JKT PER FOOT	$2.00	$150.00
4	TDN8812	3/8" CONN PLTD N PLUG MALE	$34.00	$136.00
1	TDN6673	1/2" CABLE GROUND CLAMP KIT	$26.00	$26.00
1	TDN9289	CABLE WRAP WEATHERPROOFING	$36.00	$36.00
1	DSISDC50LNZ15	DC INJECTOR 15V	$121.00	$121.00
150	L1704	3/8" LDF HELIAX POLY JKT PER FOOT	$2.00	$300.00
2	TDN8812	3/8" CONN PLTD N PLUG MALE	$34.00	$68.00
3	CDN6510	1/2" SURE GROUND	$27.00	$81.00
5	TDN8376	3/8" SELF LOCKING HANGER KIT	$13.00	$65.00
5	TDN9289	CABLE WRAP WEATHERPROOFING	$36.00	$180.00
1	DSISMR50LNZ6	MICROWAVE COAX PROTECTOR 6V	$122.00	$122.00
50	L1700	1/4" SUPERFLEX POLY JKT PER FOOT	$2.00	$100.00
2	TDN9716	1/4" CONN N MALE RA PLTD	$39.00	$78.00
1	DSTRAK91009	REMOTE SITE CONFIG AC POWER	$27,661.00	$27,661.00
2	DSTRAK91061	FOUR PORT DDM	$633.00	$1,266.00
1	DSAPEXMOV120W	208/120 VAC, 3 PHASE. 50KA MOV.	$2,006.00	$2,006.00
1	DSAPEX4120WM	208/120 VAC, 3-PHASE. 10KA SADS PRI	$5,015.00	$5,015.00
2	THN1013	RACK 7.5' OPEN	$421.00	$842.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X288	ENH: REMOTE RSS CAPABILITY	$170.00	$170.00
1	X432	ADD: MANUAL, SERVICE	$170.00	$170.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X882	ADD: 7.5' OPEN RACK-QUANTAR, 48RU	$421.00	$421.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X380	ALT: STATION, 2ND FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	X381	ALT: STATION, 3RD FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X382	ALT: STATION, 4TH FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X383	ALT: STATION, 5TH FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X384	ALT: STATION, 6TH FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X432	ADD: MANUAL, SERVICE	$170.00	$170.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X882	ADD: 7.5' OPEN RACK-QUANTAR, 48RU	$421.00	$421.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X380	ALT: STATION, 2ND FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X381	ALT: STATION, 3RD FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	C99ED	QUANTAR/QUANTRO FAMILY	$5,760.00	$5,760.00
1	001C	QUANTAR STATION	$0.00	$0.00
1	X382	ALT: STATION, 4TH FROM BOTTOM	$0.00	$0.00
1	X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$5,367.00	$5,367.00
1	X888	ADD: GPS SIMULCAST	$850.00	$850.00
1	X889	ADD: ASTRO W/L INTFC V.24	$425.00	$425.00
1	X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$2,338.00	$2,338.00
1	SQM01SUM0067	MTC 3600 SZ RESC	$24,140.00	$24,140.00
1	D275AK	ADD: REDUNDANT POWER SUPPLY	$706.00	$706.00
1	D391AO	ADD: 7 CHANNELS (14 CH CTY)	$6,460.00	$6,460.00
1	D396AP	ADD: MANUAL, MTC 3600 SMARTZONE SIM	$288.00	$288.00
1	Z389	ADD: ASTRO MIXED MODE OPERATION	$5,483.00	$5,483.00
1	DSPREM891830	UNIVERSAL ENCLOSURE TENSR 800	$1,518.00	$1,518.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	DSPREM8901	AC POWER SUPPLY 110/220VAC	$886.00	$886.00
1	DSPREM880460	CPU 2T1 E1 RCON BUS-CONNECT	$3,102.00	$3,102.00
1	DSPREM892160	8T1 E1 IF CARD 32K NO MODEM	$2,024.00	$2,024.00
1	DSPREM801060	DUAL T1 E1 WAN CARD	$2,151.00	$2,151.00
2	DSPREM81130	DSX CEPT PLUG IN MODULE	$633.00	$1,266.00
3	DSPREM816460	4 PORT 4W DSM CARD	$9,614.00	$28,842.00
2	DSPREM822061	10 PORT RS232C SRU	$2,760.00	$5,520.00
1	THN1013	RACK 7.5' OPEN	$421.00	$421.00
1	F4540	NFM RTU WITH I/O 48VDC	$3,570.00	$3,570.00
1	V261	ALT: 110/220V 3A TO 8A	$258.00	$258.00
1	V346	ADD: 120V 3A + 5A/H BAT ON 19I	$561.00	$561.00
1	F4545	NFM RTU MULTIPORT 48VDC	$1,700.00	$1,700.00
2	V426	ADD: NFM CPU	$1,020.00	$2,040.00
1	F4545	NFM RTU MULTIPORT 48VDC	$1,700.00	$1,700.00
1	F6977	MOSCAD ACCESSORY	$0.00	$0.00
3	V184	ADD: RS232 MULTIPLEXER	$247.00	$741.00
1	V186	ADD: RS485 JUNCTION BOX	$81.00	$81.00
3	V440	ADD: RS485 3 METER CABLE	$14.00	$42.00
1	F5999ASP15511	POWER BRIDGE FOR DC DISTRIBUTION, O	$247.00	$247.00
1	DQMWNA208121	MW Move	$19,752.00	$19,752.00
1	DSPD2208	ANTENNA 216-225MHZ OMNI 5.25DB	$909.00	$909.00
150	L1705	1/2" LDF HELIAX POLY JKT PER FT	$3.00	$450.00
2	TDN8816	1/2" CONNECTOR R A N PLUG LDF PLTD	$64.00	$128.00
5	TDN9289	CABLE WRAP WEATHERPROOFING	$36.00	$180.00
3	CDN6510	1/2" SURE GROUND	$27.00	$81.00
1	DS204679A16	4" BOOT 4 HOLE 1/2" LDF	$73.00	$73.00
1	DSISB50HNC1	COAX PROTECTOR BULKHEAD	$82.00	$82.00
50	L1702	1/2" SUPERFLEX POLY JKT PER FOOT	$4.00	$200.00
2	TDN9714	1/4" CONN N MALE S FLEX PLTD	$28.00	$56.00
5	DSTSJ100BT	EIGHT WIRE PROTECTION MODULE WITH R	$145.00	$725.00
		TOWER 41 EQUIPMENT TOTAL		**$351,949.00**

Miami Beach Subscribers

Qty.	Model	Description	Unit Price	Extended
		MOBILE 800 MHZ RADIOS		
ASTRO SPECTRA SERIES				
	ASTRO DIGITAL	**SPECTRA W5 SMARTNET w/DUAL CONTROL HEAD**		
31	T99DX	ASTRO DIGITAL SPECTRA MOBILE SER	**$3,837.00**	**$118,947.00**
	131W	MOBILE ASTRO SPECTRA W5 800 MHZ 35W		
	G50	ENH: SOFTWARE SMARTNET SYSTEM		
	G114	ENH: DIGITAL ID DISPLAY		
	G806	ENH: SOFTWARE ASTRO DIGITAL COMMON		
	G829	ADD: DUAL CONTROL HEAD CABLE 40FT		
	G831	ADD: DUAL CONTROL HEAD SPEAKER 13 W		
	W800	ADD: DUAL CONTROL HEAD- W5		
	ASTRO DIGITAL	**SPECTRA W5 SMARTNET MOBILES**		
14	T99DX	ASTRO SPECTRA DIGITAL MOBILE	**$3,239.00**	**$45,346.00**
	131W	35Watt 800 806-870 W9, 1/4 Wave Antenna		
	G50	ENH: ASTRO DIGITAL CAI		
	G114	ENH: SMARTZONE OPERATION		
	G806	10 Watt AUDIO		
	W432	DIGITAL ID DISPLAY		
	ASTRO DIGITAL	**SPECTRA W5 SMARTNET MOTORCYCLE RADIOS**		
21	M99DX	ASTRO SPECTRA MOTORCYCLE	**$3,623.00**	**$76,083.00**
	177W	MOBILE ASTRO SPECTRA MOTORCYCLE W5		
	G114	ENH: DIGITAL ID DISPLAY		
	G50	ENH: SOFTWARE SMARTNET SYSTEM		
	G806	ENH: SOFTWARE ASTRO DIGITAL COMMON		
	W15	ADD: HOUSING WEATHERPROOF BLACK		
	W620	DEL: WEATHERPROOF HOUSING		
	ASTRO Digital SPECTRA SMARTNET Consolette Control Stations			
7	L99DX	ASTRO SPECTRA	**$5,845.00**	**$40,915.00**
	259L	W7 35 WATTS 806-870 MHZ		
	G114	ENH: DIGITAL PTT-ID CONSOL		
	G50	ENH: SMARTNET SOFTWARE		
	G806	ENH: IMBE UPGRADE		
	L146	ENH: LOCAL TONE REMOTE		
CONSOLETTE ANTENNA SYSTEM				
7	TDF7160	ANTENNA 800 DIPOLE 8.0 DBD	$386.00	$2,702.00
700	L1704	3/8" LDF HELIAX POLY JKT PER FOOT	$2.00	$1,400.00

Qty.	Model	Description	Unit Price	Extended
14	TDN8812	3/8" CONN PLTD N PLUG MALE	$34.00	$476.00
21	CDN6510	1/2" SURE GROUND	$27.00	$567.00
21	TDN9289	CABLE WRAP WEATHERPROOFING	$36.00	$756.00
8	DSISB50LNC2	COAX PROTECTOR	$76.00	$608.00
7	DQ10AMFN20	ATTENUATOR	$136.00	$952.00
		SUBSCRIBER EQUIPMENT TOTAL		**$288,752.00**

Qty	Nomenclature	Description	Unit Price	Extended Total
	Miami Beach 8 Position Dispatch Center			
1	B1842 A	B1842AA - 1 Card Cage Ambassador El	$24,965.00	$24,965.00
3	K994AJ	K994AJ - Add: One Ambassador Board	$11,347.00	$34,041.00
1	X762AB	X762AB - Add: Redundant Zone Contro	$22,692.00	$22,692.00
1	K565AC	K565AC - ADD: DIAGNOSTIC INTERFACE	$253.00	$253.00
1	X989AJ	X989AJ - ADD: ASTRO SMARTZONE LICEN	$21,250.00	$21,250.00
1	B1811 F	CENTRACOM GOLD CENTRAL ELECTRONICS	$49,836.00	$49,836.00
1	K995AC	ALT: MODULES, AMBASSADOR INTERFACE	$10,262.00	$10,262.00
6	K259	ADD: CABLE, 25-PAIR, 15 FOOT AND PU	$0.00	$0.00
2	K206AF	ADD: BATTERY, BACK-UP TO CEB (FOR D	$638.00	$1,276.00
1	K206AE	ADD: BATTERY, BACK-UP TO CEB (FOR S	$425.00	$425.00
1	X643AA	AEB-CEB Co-located Link - AEB and C	$0.00	$0.00
1	K164AGSP	ALT: RACK, REPLACE TWO 90 INCH RACK	$510.00	$510.00
12	K153AB	ALT: CABLE, 25-PAIR, 50 FOOT (DELET	$63.00	$756.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
2	B1850 B	CENTRACOM GOLD INTERFACE MODULES FO	$14,990.00	$29,980.00
1	K553AA	ENH: SMARTNET II	$0.00	$0.00
1	B1827	CENTRACOM GOLD SOFTWARE LICENSE MAN	$94.00	$94.00
11	X597AE	ADD: SOFTWARE LICENSE, CONVENTIONAL	$170.00	$1,870.00
8	X293	ADD: SOFTWARE LICENSE, ELITE OPERAT	$3,400.00	$27,200.00
1	X285	ADD: SOFTWARE LICENSE, ASTRO SMARTZ	$850.00	$850.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00

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1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
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Qty	Nomenclature	Description	Unit Price	Extended Total
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	**$0.00**	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	K385AB	EHN: SUPERVISOR CONTROL, PRIMARY LE	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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Qty	Nomenclature	Description	Unit Price	Extended Total
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	L3243A	CENTRACOM GOLD ELITE SERVER	$4,508.00	$4,508.00
1	L3235	WIN 2000 5 CLIENT ACC LIC	$247.00	$247.00
8	L3142	HP MINITOWER	$1,472.00	$11,776.00
8	ZA00246AA	ELITE CLIENT OPT, WIN 2000	$1,545.00	$12,360.00
1	CDN6393	SUPERSTACK II 24 PORT HUB 40	$1,232.00	**$1,232.00**
1	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$1,380.00
1	DQ8188	ETHERNET TIME SERVER	$1,243.00	$1,243.00
7	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$9,660.00
1	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$1,380.00
		CENTRACOM ELITE GOLD CONSOLE EQUIPMENT TOTAL		**$347,405.00**

System Totals Summary

PRIME SITE EQUIPMENT TOTAL	$1,676,573.00
FIRE STATION 2 EQUIPMENT TOTAL	$347,433.00
75th STREET RESERVOIR EQUIPMENT TOTAL	$711,410.00
REBECCA TOWERS EQUIPMENT TOTAL	$166,422.00
TOWER 41 EQUIPMENT TOTAL	$351,949.00
SUBSCRIBER EQUIPMENT TOTAL	$288,752.00
CENTRACOM ELITE GOLD CONSOLE EQUIPMENT TOTAL	$347,405.00
EQUIPMENT INSTALLATION AND SERVICES	$200,649.00

FACILITIES, TOWER AND CIVILS

REBECCA TOWER RECEIVE ONLY SITE	$47,077.00
OLD CITY HALL	$8,462.00
FIRE STATION 2 SIMULCAST TX-RX SITE	$144,917.00
POLICE DISPATCH ROOM	$93,846.00
POLICE DISPATCH EQUIPMENT ROOM	$34,615.00
NEW CITY HALL	$5,285.00
TOWER 41 SIMULCAST TX-RX SITE	$67,509.00
75th STREET RESERVOIR SIMULCAST TX-RX SITE	$607,774.00
LAGORCE PALACE (EQUIPMENT REMOVAL)	$7,692.00
POLICE HEADQUARTERS BDA	$130,769.00
PROPOSED SUBSCRIBER PROGRAMMING	$43,846.00
User Training	$62,615.00
Proposal Total, Before System Purchase Discount:	$5,345,000.00
TRADE IN OF OLD SYSTEM *	($445,000.00)
800 MHz Trunked Radio System Total:	**$4,900,000.00**

*DOES NOT INCLUDE ITEMS RETAINED BY CITY PER STATEMENT OF WORK

Qty	Nomenclature	Description	Unit Price	Extended Total
	Miami Beach Optional 6 Position 2 Remote Op. Dispatch Center			
1	B1842 A	B1842AA - 1 Card Cage Ambassador El	$24,965.00	$24,965.00
3	K994AJ	K994AJ - Add: One Ambassador Board	$11,347.00	$34,041.00
1	X762AB	X762AB - Add: Redundant Zone Contro	$22,692.00	$22,692.00
1	X746AB	X746AB - AEB Spares	$13,691.00	$13,691.00
1	K565AC	K565AC - ADD: DIAGNOSTIC INTERFACE	$253.00	$253.00
1	X989AJ	X989AJ - ADD: ASTRO SMARTZONE LICEN	$21,250.00	$21,250.00
1	B1811 F	CENTRACOM GOLD CENTRAL ELECTRONICS	$49,836.00	$49,836.00
1	K995AC	ALT: MODULES, AMBASSADOR INTERFACE	$10,262.00	$10,262.00
6	K259	ADD: CABLE, 25-PAIR, 15 FOOT AND PU	$0.00	$0.00
2	K206AF	ADD: BATTERY, BACK-UP TO CEB (FOR D	$638.00	$1,276.00
1	K206AE	ADD: BATTERY, BACK-UP TO CEB (FOR S	$425.00	$425.00
1	X643AA	AEB-CEB Co-located Link - AEB and C	$0.00	$0.00
1	K164AGSP	ALT: RACK, REPLACE TWO 90 INCH RACK	$510.00	$510.00
12	K153AB	ALT: CABLE, 25-PAIR, 50 FOOT (DELET	$63.00	$756.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
2	BKN1001 200	CABLE, 7 PAIR, PLENUM, 200 FOOT	$1,240.00	$2,480.00
4	BKN6078	CABLE, 7 PAIR, PLENUM, 100 FOOT	$216.00	$864.00
2	B1850 B	CENTRACOM GOLD INTERFACE MODULES FO	$14,990.00	$29,980.00
1	K553AA	ENH: SMARTNET II	$0.00	$0.00
1	B1827	CENTRACOM GOLD SOFTWARE LICENSE MAN	$94.00	$94.00
11	X597AE	ADD: SOFTWARE LICENSE, CONVENTIONAL	$170.00	$1,870.00
8	X293	ADD: SOFTWARE LICENSE, ELITE OPERAT	$3,400.00	$27,200.00
1	X285	ADD: SOFTWARE LICENSE, ASTRO SMARTZ	$850.00	$850.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	K565	ADD: INTERFACE, RS232 (BOARD AND CA	$253.00	$253.00
1	K238BASP	ADD: REMOTE OPERATOR (9600 BAUD)	$2,870.00	$2,870.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	K565	ADD: INTERFACE, RS232 (BOARD AND CA	$253.00	$253.00
1	K238BASP	ADD: REMOTE OPERATOR (9600 BAUD)	$2,870.00	$2,870.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	K385AB	EHN: SUPERVISOR CONTROL, PRIMARY LE	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	L3243A	CENTRACOM GOLD ELITE SERVER	$4,508.00	$4,508.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	L3235	WIN 2000 5 CLIENT ACC LIC	$247.00	$247.00
8	L3142	HP MINITOWER	$1,472.00	$11,776.00
8	ZA00246AA	ELITE CLIENT OPT, WIN 2000	$1,545.00	$12,360.00
1	CDN6393	SUPERSTACK II 24 PORT HUB 40	$1,232.00	$1,232.00
1	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$1,380.00
1	DQ8188	ETHERNET TIME SERVER	$1,243.00	$1,243.00
2	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$2,760.00
5	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$6,900.00
1	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$1,380.00
		OPTIONAL: CENTRACOM ELITE GOLD CONSOLE TOTAL		**$370,686.00**

Qty	Nomenclature	Description	Unit Price	Extended Total
	Miami Beach Optional 9 Position Dispatch Center			
1	B1842 A	CENTRACOM GOLD AMBASSADOR ELECTRONI	$24,965.00	$24,965.00
5	K994AJ	ADD: MODULE, AMBASSADOR	$11,347.00	$56,735.00
1	X762AB	ADD: INTERFACE, ZONE CONTROLLER (TW	$22,692.00	$22,692.00
1	X746AB	ADD: SPARES, AMBASSADOR ELECTRONICS	$13,691.00	$13,691.00
1	K565AC	ADD: INTERFACE, RS232 (CABLE ONLY)	$253.00	$253.00
1	X989AJ	ADD: SOFTWARE LICENSE, ASTRO SMARTZ	$21,250.00	$21,250.00
1	B1811 B	CENTRACOM GOLD CENTRAL ELECTRONICS	$16,643.00	$16,643.00
1	K995AC	ALT: MODULES, AMBASSADOR INTERFACE	$10,262.00	$10,262.00
1	K206AF	ADD: BATTERY, BACK-UP TO CEB (FOR D	$638.00	$638.00
1	X643	ENH: AEB-CEB LINK TYPE, E1	$0.00	$0.00
1	K164AESP	ALT: RACK, REPLACE ONE 90 INCH RACK	$255.00	$255.00
2	K153AB	ALT: CABLE, 25-PAIR, 50 FOOT (DELET	$63.00	$126.00
1	BKN1000 200	CABLE, 7 PAIR, 200 FOOT	$410.00	$410.00
1	B1827	CENTRACOM GOLD SOFTWARE LICENSE MAN	$94.00	$94.00
1	X293	ADD: SOFTWARE LICENSE, ELITE OPERAT	$3,400.00	$3,400.00
1	X285	ADD: SOFTWARE LICENSE, ASTRO SMARTZ	$850.00	$850.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K801BF	DEL: OPERATOR POSITION HARDWARE (KE	($2,678.00)	($2,678.00)
1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
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1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	L3142	HP MINITOWER	$1,472.00	$1,472.00
1	ZA00246AA	ELITE CLIENT OPT, WIN 2000	$1,545.00	$1,545.00
1	CDN6393	SUPERSTACK II 24 PORT HUB 40	$1,232.00	$1,232.00
1	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$1,380.00
1	B1811 F	CENTRACOM GOLD CENTRAL ELECTRONICS	$49,836.00	$49,836.00
1	K995AC	ALT: MODULES, AMBASSADOR INTERFACE	$10,262.00	$10,262.00

Qty	Nomenclature	Description	Unit Price	Extended Total
6	K259	ADD: CABLE, 25-PAIR, 15 FOOT AND PU	$0.00	$0.00
2	K206AF	ADD: BATTERY, BACK-UP TO CEB (FOR D	$638.00	$1,276.00
1	K206AE	ADD: BATTERY, BACK-UP TO CEB (FOR S	$425.00	$425.00
1	X643AA	ENH: AEB-CEB LINK TYPE, CO-LOCATED	$0.00	$0.00
1	K164AGSP	ALT: RACK, REPLACE TWO 90 INCH RACK	$510.00	$510.00
12	K153AB	ALT: CABLE, 25-PAIR, 50 FOOT (DELET	$63.00	$756.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
4	BKN1001 200	CABLE, 7 PAIR, PLENUM, 200 FOOT	$1,240.00	$4,960.00
4	BKN6078	CABLE, 7 PAIR, PLENUM, 100 FOOT	$216.00	$864.00
1	B1813	CENTRACOM GOLD SPARE MODULE, CONSOL	$4,208.00	$4,208.00
1	B1852	CENTRACOM GOLD SPARES FOR EMBASSY C	$8,205.00	$8,205.00
1	B1814	CENTRACOM GOLD SPARES FOR CLASSIC C	$2,542.00	$2,542.00
2	B1850 B	CENTRACOM GOLD INTERFACE MODULES FO	$14,990.00	$29,980.00
1	B1849	CENTRACOM GOLD INTERFACE MODULES FO	$29,056.00	$29,056.00
1	K553AA	ENH: SMARTNET II	$0.00	$0.00
1	B1827	CENTRACOM GOLD SOFTWARE LICENSE MAN	$94.00	$94.00
11	X597AE	ADD: SOFTWARE LICENSE, CONVENTIONAL	$170.00	$1,870.00
8	X293	ADD: SOFTWARE LICENSE, ELITE OPERAT	$3,400.00	$27,200.00
1	X285	ADD: SOFTWARE LICENSE, ASTRO SMARTZ	$850.00	$850.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
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1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
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1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	CRT DATA	$0.00	$0.00
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1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	CRT DATA	$0.00	$0.00
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Qty	Nomenclature	Description	Unit Price	Extended Total
1	CRTDATA	CRT DATA	$0.00	$0.00
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1	CRTDATA	CRT DATA	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
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1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	CRT DATA	$0.00	$0.00
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1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
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1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	K385AB	EHN: SUPERVISOR CONTROL, PRIMARY LE	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
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1	CRTDATA	CRT DATA	$0.00	$0.00
1	CRTDATA	CRT DATA	$0.00	$0.00
1	L3243A	CENTRACOM GOLD ELITE SERVER	$4,508.00	$4,508.00
1	L3235	WIN 2000 5 CLIENT ACC LIC	$247.00	$247.00
8	L3142	HP MINITOWER	$1,472.00	$11,776.00
8	ZA00246AA	ELITE CLIENT OPT, WIN 2000	$1,545.00	$12,360.00
1	CDN6393	SUPERSTACK II 24 PORT HUB 40	$1,232.00	$1,232.00
1	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$1,380.00
1	DQ8188	ETHERNET TIME SERVER	$1,243.00	$1,243.00
7	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$9,660.00
1	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$1,380.00
		OPTIONAL: CENTRACOM GOLD ELITE CONSOLE TOTAL		**$486,010.00**

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Qty	Nomenclature	Description	Unit Price	Extended Total
	Miami Beach Optional 10 Position Dispatch Center			
1	B1842 A	B1842AA - 1 Card Cage Ambassador El	$24,965.00	$24,965.00
5	K994AJ	K994AJ - Add: One Ambassador Board	$11,347.00	$56,735.00
1	X762AB	X762AB - Add: Redundant Zone Contro	$22,692.00	$22,692.00
1	X746AB	X746AB - AEB Spares	$13,691.00	$13,691.00
1	K565AC	K565AC - ADD: DIAGNOSTIC INTERFACE	$253.00	$253.00
1	X989AJ	X989AJ - ADD: ASTRO SMARTZONE LICEN	$21,250.00	$21,250.00
1	B1811 B	CENTRACOM GOLD CENTRAL ELECTRONICS	$16,643.00	$16,643.00
1	K995AC	ALT: MODULES, AMBASSADOR INTERFACE	$10,262.00	$10,262.00
1	K206AF	ADD: BATTERY, BACK-UP TO CEB (FOR D	$638.00	$638.00
1	X643	AEB-CEB T1 - Single T1 per AIMI	$0.00	$0.00
1	K164AESP	ALT: RACK, REPLACE ONE 90 INCH RACK	$255.00	$255.00
2	K153AB	ALT: CABLE, 25-PAIR, 50 FOOT (DELET	$63.00	$126.00
2	BKN1000 200	CABLE, 7 PAIR, 200 FOOT	$410.00	$820.00
1	B1827	CENTRACOM GOLD SOFTWARE LICENSE MAN	$94.00	$94.00
2	X293	ADD: SOFTWARE LICENSE, ELITE OPERAT	$3,400.00	$6,800.00
1	X285	ADD: SOFTWARE LICENSE, ASTRO SMARTZ	$850.00	$850.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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Qty	Nomenclature	Description	Unit Price	Extended Total
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
2	L3142	HP MINITOWER	$1,472.00	$2,944.00
2	ZA00246AA	ELITE CLIENT OPT, WIN 2000	$1,545.00	$3,090.00
1	CDN6393	SUPERSTACK II 24 PORT HUB 40	$1,232.00	$1,232.00
2	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$2,760.00
1	B1811 F	CENTRACOM GOLD CENTRAL ELECTRONICS	$49,836.00	$49,836.00
1	K995AC	ALT: MODULES, AMBASSADOR INTERFACE	$10,262.00	$10,262.00
6	K259	ADD: CABLE, 25-PAIR, 15 FOOT AND PU	$0.00	$0.00
2	K206AF	ADD: BATTERY, BACK-UP TO CEB (FOR D	$638.00	$1,276.00
1	K206AE	ADD: BATTERY, BACK-UP TO CEB (FOR S	$425.00	$425.00
1	X643AA	AEB-CEB Co-located Link - AEB and C	$0.00	$0.00
1	K164AGSP	ALT: RACK, REPLACE TWO 90 INCH RACK	$510.00	$510.00
12	K153AB	ALT: CABLE, 25-PAIR, 50 FOOT (DELET	$63.00	$756.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
4	BKN1001 200	CABLE, 7 PAIR, PLENUM, 200 FOOT	$1,240.00	$4,960.00
4	BKN6078	CABLE, 7 PAIR, PLENUM, 100 FOOT	$216.00	$864.00
1	B1813	CENTRACOM GOLD SPARE MODULE, CONSOL	$4,208.00	$4,208.00
1	B1852	CENTRACOM GOLD SPARES FOR EMBASSY C	$8,205.00	$8,205.00
1	B1814	CENTRACOM GOLD SPARES FOR CLASSIC C	$2,542.00	$2,542.00
2	B1850 B	CENTRACOM GOLD INTERFACE MODULES FO	$14,990.00	$29,980.00
1	B1849	CENTRACOM GOLD INTERFACE MODULES FO	$29,056.00	$29,056.00
1	K553AA	ENH: SMARTNET II	$0.00	$0.00
1	B1827	CENTRACOM GOLD SOFTWARE LICENSE MAN	$94.00	$94.00
11	X597AE	ADD: SOFTWARE LICENSE, CONVENTIONAL	$170.00	$1,870.00
8	X293	ADD: SOFTWARE LICENSE, ELITE OPERAT	$3,400.00	$27,200.00
1	X285	ADD: SOFTWARE LICENSE, ASTRO SMARTZ	$850.00	$850.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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Qty	Nomenclature	Description	Unit Price	Extended Total
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	K385AB	EHN: SUPERVISOR CONTROL, PRIMARY LE	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	L3243A	CENTRACOM GOLD ELITE SERVER	$4,508.00	$4,508.00
1	L3235	WIN 2000 5 CLIENT ACC LIC	$247.00	$247.00
8	L3142	HP MINITOWER	$1,472.00	$11,776.00
8	ZA00246AA	ELITE CLIENT OPT, WIN 2000	$1,545.00	$12,360.00
1	CDN6393	SUPERSTACK II 24 PORT HUB 40	$1,232.00	$1,232.00
1	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$1,380.00
1	DQ8188	ETHERNET TIME SERVER	$1,243.00	$1,243.00
7	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$9,660.00
1	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$1,380.00
		OPTIONAL: CENTRACOM GOLD ELITE CONSOLE TOTAL		**$497,475.00**

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Qty	Nomenclature	Description	Unit Price	Extended Total
	Miami Beach Optional 11 Position Dispatch Center			
1	DQ8188	ETHERNET TIME SERVER	$1,243.00	$1,243.00
1	K565AC	K565AC - ADD: DIAGNOSTIC INTERFACE	$253.00	$253.00
1	K995AC	ALT: MODULES, AMBASSADOR INTERFACE	$10,262.00	$10,262.00
1	X643	AEB-CEB T1 - Single T1 per AIMI	$0.00	$0.00
2	K153AB	ALT: CABLE, 25-PAIR, 50 FOOT (DELET	$63.00	$126.00
3	BKN1000 200	CABLE, 7 PAIR, 200 FOOT	$410.00	$1,230.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	K995AC	ALT: MODULES, AMBASSADOR INTERFACE	$10,262.00	$10,262.00
6	K259	ADD: CABLE, 25-PAIR, 15 FOOT AND PU	$0.00	$0.00
1	X643AA	AEB-CEB Co-located Link - AEB and C	$0.00	$0.00
12	K153AB	ALT: CABLE, 25-PAIR, 50 FOOT (DELET	$63.00	$756.00
4	BKN1001 200	CABLE, 7 PAIR, PLENUM, 200 FOOT	$1,240.00	$4,960.00
4	BKN6078	CABLE, 7 PAIR, PLENUM, 100 FOOT	$216.00	$864.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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Qty	Nomenclature	Description	Unit Price	Extended Total
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	K553AA	ENH: SMARTNET II	$0.00	$0.00
1	K385AB	EHN: SUPERVISOR CONTROL, PRIMARY LE	$0.00	$0.00
1	B1842 A	B1842AA - 1 Card Cage Ambassador El	$24,965.00	$24,965.00
5	K994AJ	K994AJ - Add: One Ambassador Board	$11,347.00	$56,735.00
1	X762AB	X762AB - Add: Redundant Zone Contro	$22,692.00	$22,692.00
1	X746AB	X746AB - AEB Spares	$13,691.00	$13,691.00
1	X989AJ	X989AJ - ADD: ASTRO SMARTZONE LICEN	$21,250.00	$21,250.00
1	B1811 B	CENTRACOM GOLD CENTRAL ELECTRONICS	$16,643.00	$16,643.00
1	K206AF	ADD: BATTERY, BACK-UP TO CEB (FOR D	$638.00	$638.00
1	B1827	CENTRACOM GOLD SOFTWARE LICENSE MAN	$94.00	$94.00
3	X293	ADD: SOFTWARE LICENSE, ELITE OPERAT	$3,400.00	$10,200.00
1	X285	ADD: SOFTWARE LICENSE, ASTRO SMARTZ	$850.00	$850.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	B1811 F	CENTRACOM GOLD CENTRAL ELECTRONICS	$49,836.00	$49,836.00
2	K206AF	ADD: BATTERY, BACK-UP TO CEB (FOR D	$638.00	$1,276.00
1	K206AE	ADD: BATTERY, BACK-UP TO CEB (FOR S	$425.00	$425.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1813	CENTRACOM GOLD SPARE MODULE, CONSOL	$4,208.00	$4,208.00
1	B1852	CENTRACOM GOLD SPARES FOR EMBASSY C	$8,205.00	$8,205.00
1	B1814	CENTRACOM GOLD SPARES FOR CLASSIC C	$2,542.00	$2,542.00
2	B1850 B	CENTRACOM GOLD INTERFACE MODULES FO	$14,990.00	$29,980.00
1	B1849	CENTRACOM GOLD INTERFACE MODULES FO	$29,056.00	$29,056.00
1	B1827	CENTRACOM GOLD SOFTWARE LICENSE MAN	$94.00	$94.00
11	X597AE	ADD: SOFTWARE LICENSE, CONVENTIONAL	$170.00	$1,870.00
8	X293	ADD: SOFTWARE LICENSE, ELITE OPERAT	$3,400.00	$27,200.00
1	X285	ADD: SOFTWARE LICENSE, ASTRO SMARTZ	$850.00	$850.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	K164AESP	ALT: RACK, REPLACE ONE 90 INCH RACK	$255.00	$255.00
1	K164AGSP	ALT: RACK, REPLACE TWO 90 INCH RACK	$510.00	$510.00
3	L3142	HP MINITOWER	$1,472.00	$4,416.00
3	ZA00246AA	ELITE CLIENT OPT, WIN 2000	$1,545.00	$4,635.00
1	CDN6393	SUPERSTACK II 24 PORT HUB 40	$1,232.00	$1,232.00
3	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$4,140.00
1	L3243A	CENTRACOM GOLD ELITE SERVER	$4,508.00	$4,508.00
1	L3235	WIN 2000 5 CLIENT ACC LIC	$247.00	$247.00
8	L3142	HP MINITOWER	$1,472.00	$11,776.00
8	ZA00246AA	ELITE CLIENT OPT, WIN 2000	$1,545.00	$12,360.00
1	CDN6393	SUPERSTACK II 24 PORT HUB 40	$1,232.00	$1,232.00
1	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$1,380.00
7	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$9,660.00
1	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$1,380.00
		OPTIONAL: CENTRACOM GOLD ELITE CONSOLE TOTAL		**$514,350.00**

Qty	Nomenclature	Description	Unit Price	Extended Total
	Miami Beach Optional 12 Position Dispatch Center			
1	B1842 A	B1842AA - 1 Card Cage Ambassador El	$24,965.00	$24,965.00
5	K994AJ	K994AJ - Add: One Ambassador Board	$11,347.00	$56,735.00
1	X762AB	X762AB - Add: Redundant Zone Contro	$22,692.00	$22,692.00
1	X746AB	X746AB - AEB Spares	$13,691.00	$13,691.00
1	K565AC	K565AC - ADD: DIAGNOSTIC INTERFACE	$253.00	$253.00
1	X989AJ	X989AJ - ADD: ASTRO SMARTZONE LICEN	$21,250.00	$21,250.00
1	B1811 B	CENTRACOM GOLD CENTRAL ELECTRONICS	$16,643.00	$16,643.00
1	K995AC	ALT: MODULES, AMBASSADOR INTERFACE	$10,262.00	$10,262.00
1	K206AF	ADD: BATTERY, BACK-UP TO CEB (FOR D	$638.00	$638.00
1	X643	AEB-CEB T1 - Single T1 per AIMI	$0.00	$0.00
1	K164AESP	ALT: RACK, REPLACE ONE 90 INCH RACK	$255.00	$255.00
2	K153AB	ALT: CABLE, 25-PAIR, 50 FOOT (DELET	$63.00	$126.00
4	BKN1000 200	CABLE, 7 PAIR, 200 FOOT	$410.00	$1,640.00
1	B1827	CENTRACOM GOLD SOFTWARE LICENSE MAN	$94.00	$94.00
4	X293	ADD: SOFTWARE LICENSE, ELITE OPERAT	$3,400.00	$13,600.00
1	X285	ADD: SOFTWARE LICENSE, ASTRO SMARTZ	$850.00	$850.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
4	L3142	HP MINITOWER	$1,472.00	$5,888.00
4	ZA00246AA	ELITE CLIENT OPT, WIN 2000	$1,545.00	$6,180.00
1	CDN6393	SUPERSTACK II 24 PORT HUB 40	$1,232.00	$1,232.00
4	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$5,520.00
1	B1811 F	CENTRACOM GOLD CENTRAL ELECTRONICS	$49,836.00	$49,836.00
1	K995AC	ALT: MODULES, AMBASSADOR INTERFACE	$10,262.00	$10,262.00
6	K259	ADD: CABLE, 25-PAIR, 15 FOOT AND PU	$0.00	$0.00
2	K206AF	ADD: BATTERY, BACK-UP TO CEB (FOR D	$638.00	$1,276.00
1	K206AE	ADD: BATTERY, BACK-UP TO CEB (FOR S	$425.00	$425.00
1	X643AA	AEB-CEB Co-located Link - AEB and C	$0.00	$0.00
1	K164AGSP	ALT: RACK, REPLACE TWO 90 INCH RACK	$510.00	$510.00
12	K153AB	ALT: CABLE, 25-PAIR, 50 FOOT (DELET	$63.00	$756.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
1	B1840	CENTRACOM GOLD INTERFACE MODULE FOR	$739.00	$739.00
4	BKN1001 200	CABLE, 7 PAIR, PLENUM, 200 FOOT	$1,240.00	$4,960.00
4	BKN6078	CABLE, 7 PAIR, PLENUM, 100 FOOT	$216.00	$864.00
1	B1813	CENTRACOM GOLD SPARE MODULE, CONSOL	$4,208.00	$4,208.00
1	B1852	CENTRACOM GOLD SPARES FOR EMBASSY C	$8,205.00	$8,205.00
1	B1814	CENTRACOM GOLD SPARES FOR CLASSIC C	$2,542.00	$2,542.00
2	B1850 B	CENTRACOM GOLD INTERFACE MODULES FO	$14,990.00	$29,980.00
1	B1849	CENTRACOM GOLD INTERFACE MODULES FO	$29,056.00	$29,056.00
1	K553AA	ENH: SMARTNET II	$0.00	$0.00
1	B1827	CENTRACOM GOLD SOFTWARE LICENSE MAN	$94.00	$94.00
11	X597AE	ADD: SOFTWARE LICENSE, CONVENTIONAL	$170.00	$1,870.00
8	X293	ADD: SOFTWARE LICENSE, ELITE OPERAT	$3,400.00	$27,200.00
1	X285	ADD: SOFTWARE LICENSE, ASTRO SMARTZ	$850.00	$850.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
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Qty	Nomenclature	Description	Unit Price	Extended Total
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
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Qty	Nomenclature	Description	Unit Price	Extended Total
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	BKN6170	CABLE, TELEPHONE HEADSET INTERFACE	$114.00	$114.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	B1822	CENTRACOM GOLD ELITE INTERFACE ELEC	$8,088.00	$8,088.00
1	K570AE	ADD: HEADSET JACK, W/13 FOOT CABLE	$204.00	$204.00
1	K703	ADD: MICROPHONE, GOOSENECK, 9 INCH	$262.00	$262.00
1	K385AB	EHN: SUPERVISOR CONTROL, PRIMARY LE	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
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1	CRTDATA	Personality Data	$0.00	$0.00
1	CRTDATA	Personality Data	$0.00	$0.00
1	L3243A	CENTRACOM GOLD ELITE SERVER	$4,508.00	$4,508.00

Qty	Nomenclature	Description	Unit Price	Extended Total
1	L3235	WIN 2000 5 CLIENT ACC LIC	$247.00	$247.00
8	L3142	HP MINITOWER	$1,472.00	$11,776.00
8	ZA00246AA	ELITE CLIENT OPT, WIN 2000	$1,545.00	$12,360.00
1	CDN6393	SUPERSTACK II 24 PORT HUB 40	$1,232.00	$1,232.00
1	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$1,380.00
1	DQ8188	ETHERNET TIME SERVER	$1,243.00	$1,243.00
7	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$9,660.00
1	CDN6484	21 INCH VIEWSONIC, CRT, STD DEPTH M	$1,380.00	$1,380.00
		OPTIONAL: CENTRACOM GOLD ELITE CONSOLE TOTAL		**$531,225.00**

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Exhibit F **Pricing Summary Attachment**

Exhibit F

Pricing Summary Attachment

ADDENDUM 1
800 MHz TRUNKED DIGITAL SIMULCAST RADIO SYSTEM, DIGITAL MULTIPLEX, TOWER, SHELTER, AND SERVICES FOR CITY OF MIAMI BEACH, FLORIDA

PRICING SUMMARY	
SYSTEM BACKBONE EQUIPMENT	
Rebecca Tower Receive Only Site	$166,422.00
Old City Hall	PART OF PRIME
Fire Station 2 Simulcast Transmit-Receive Site	$347,433.00
Police Department Dispatch Room	$347,405.00
Police Department Equipment Room	$1,676,573.00
41st Street (Tower 41) Simulcast Transmit-Receive Site	$351,949.00
75th Street Reservoir Simulcast Transmit-Receive Site	$711,410.00
Services	$244,495.00
Training for System Manager and Users	$62,615.00
Other	
System Subtotal	$3,908,302.00
FACILITIES, TOWER AND CIVILS	
Rebecca Tower Receive Only Site	$47,077.00
Old City Hall	$8,462.00
Fire Station 2 Simulcast Transmit-Receive Site	$144,917.00
Police Department Dispatch Room	$93,846.00
Police Department Equipment Room	$34,615.00
New City Hall	$5,285.00
41st Street (Tower 41) Simulcast Transmit-Receive Site	$67,509.00
75th Street Reservoir Simulcast Transmit-Receive Site	$607,774.00
LaGorce Palace (Remove equipment and restore Site)	$7,692.00
Facilities, Tower and Civils Subtotal	**$1,017,177.00**
CRITICAL BUILDINGS (BDA's)	
Mt. Sinai Hospital	OPTIONAL EQUIP.
South Shore Hospital	OPTIONAL EQUIP.
Police Headquarters	$130,769.00
Critical Buildings Subtotal	$130,769.00
USER EQUIPMENT (From Appendix A of SOW)	$288,752.00
371 MTS PORTABLES FROM THE OLYMPICS A VALUE OF: $927,500.00	**N/C**
250 VEHCULAR CHARGERS A VALUE OF: $23,750.00	**N/C**
TWO ADDED YEARS OF SUBCRIBER WARRANTY A VALUE $110,542.00	**N/C**
PROGRAMMING SOFTWARE AND REQUIRED ACCESSORIES	SEE EQUIP. LIST
ESSENTIAL SYSTEM SPARES	INCLUDED
KEY VARIABLE LOADER FOR ENCRYPTION WITH REQUIRED ACCESSORIES	SEE EQUIP. LIST

ADDENDUM 1
800 MHz TRUNKED DIGITAL SIMULCAST RADIO SYSTEM, DIGITAL MULTIPLEX, TOWER, SHELTER, AND SERVICES FOR CITY OF MIAMI BEACH, FLORIDA

1 YEAR WARRANTY MAINTENANCE INCLUDING MICROWAVE BACKBONE	INCLUDED
TRADE IN	($445,000.00)
SYSTEM TOTAL	**$4,900,000.00**
NEGOTIATION DISCOUNT	**$50,000.00**
SYSTEM TOTAL AFTER NEGOTIATION DISCOUNT	**$4,850,000.00**

MAINTENANCE SERVICE SUBSEQUENT TO WARRANTY YEAR BASED ON CONTRACT QUANTITIES		Totals from Bid Response	Totals After Negotiations
System Maintenance Year 2 (Including Microwave Backbone)		$267,506.00	$254,131.00
System Maintenance Year 3 (Including Microwave Backbone)		$275,532.00	$261,755.00
System Maintenance Year 4 (Including Microwave Backbone)		$283,798.00	$269,608.00
System Maintenance Year 5 (Including Microwave Backbone)		$292,311.00	$277,695.00
System Maintenance Year 6 (Including Microwave Backbone)		$301,081.00	$286,027.00
System Maintenance Year 7 (Including Microwave Backbone)		$310,114.00	$294,608.00
System Maintenance Year 8 (Including Microwave Backbone)		$319,418.00	$303,447.00
System Maintenance Year 9 (Including Microwave Backbone)		$329,002.00	$312,552.00
System Maintenance Year 10 (Including Microwave Backbone)		$338,873.00	$321,929.00
SUBSCRIBER MAINTENANCE YEAR 2		N/C	N/C
SUBSCRIBER MAINTENANCE YEAR 3		N/C	N/C
SUBSCRIBER MAINTENANCE YEAR 4		$57,771.00	$57,771.00
SUBSCRIBER MAINTENANCE YEAR 5		$59,504.00	$59,504.00
SUBSCRIBER MAINTENANCE YEAR 6		$61,289.00	$61,289.00
**SUBSCRIBER MAINTENANCE YEAR 7		$63,128.00	$63,128.00
**SUBSCRIBER MAINTENANCE YEAR 8		$65,022.00	$65,022.00
**SUBSCRIBER MAINTENANCE YEAR 9		$66,973.00	$66,973.00
**SUBSCRIBER MAINTENANCE YEAR 10		$68,982.00	$68,982.00
TOTAL TEN YEARS MAINTENANCE SERVICE		$3,160,304.00	$3,024,421.00
TOTAL SAVINGS FOR MIAMI BEACH AFTER NEGOTIATIONS			$135,883.00

ADDENDUM 1
800 MHz TRUNKED DIGITAL SIMULCAST RADIO SYSTEM, DIGITAL MULTIPLEX, TOWER, SHELTER, AND SERVICES FOR CITY OF MIAMI BEACH, FLORIDA

OPTIONAL EQUIPMENT PRICING		
*Dispatch Console Position # 9 (installed)		$67,212.00
*Dispatch Console Position #10 (installed)	(Positions 9+10)	$101,136.00
*Dispatch Console Position #11 (installed)	(Positions 9 - 11)	$128,630.00
*Dispatch Console Position #12 (installed)	(Positions 9 - 12)	$139,804.00
*Remote Dispatch Option per Console (installed)		$25,740.00
Additional Back-up RF Control per Console (installed)		$8,348.00
Quantity 40 Plantronics Supra Headsets		$15,040.00
Five Ton Air-conditioning Unit for FS 2 Site (installed)		$15,851.00
FM200 Fire Protection System for 75th Street Site (installed)		$18,053.00
Three Channel Centralized Telephone Interconnect (installed)		$82,312.00
Mt. Sinai Hospital BDA		N/C (IF NEEDED)
South Shore Hospital BDA		N/C(IF NEEDED)

*Addition console position starting from 8th position
**Schedule reflects increases at 3% annually; however, actual cost increases will be calculated at the lesser of 3% or the year-to-year change in the CPI for Urban South Florida.

ADDENDUM 1
800 MHz TRUNKED DIGITAL SIMULCAST RADIO SYSTEM, DIGITAL MULTIPLEX, TOWER, SHELTER, AND SERVICES FOR CITY OF MIAMI BEACH, FLORIDA

OPTIONAL SPARES (LIST ESSENTIAL SPARES WITH SYSTEM COST)

Nomenclature/Option	Description		Unit Price	Location
T6694	MZC 3000 FRU'S, DELUXE ASTRO 4.1	$	43,459.00	Prime
T6713	USER CONFIGURATION SERVER	$	17,000.00	Prime
DSJ4813A	HP PROCURVE SWITCH 2524	$	1,175.00	Prime
DSGDTL158AR3	DATA BROADCAST BOX W/DB 25 PIN CONN	$	443.00	Prime
X746AB	X746AB - AEB Spares	$	16,107.00	Prime
B1813	CENTRACOM GOLD SPARE MODULE, CONSOL	$	4,950.00	Prime
B1852	CENTRACOM GOLD SPARES FOR EMBASSY C	$	9,653.00	Prime
B1814	CENTRACOM GOLD SPARES FOR CLASSIC C	$	2,991.00	Prime
D179CD	ADD: MTC 3600 SIMUL PRIM SPARE	$	19,565.00	Prime
T5770	ASTRO TAC 3000 COMPARATOR	$	3,700.00	Prime
X153	ADD: HARDWARE, RACKMOUNT	$	-	Prime
X225	ADD: 6 WIRELINE I/O PORTS-CAI	$	3,000.00	Prime
X242	ENH: DIGITAL AND ANALOG OPRN	$	2,800.00	Prime
X888	ENH: GPS SIMULCAST OPERATION	$	2,800.00	Prime
X889	ADD: ASTRO V.24 WIRELINE INTERFACE	$	500.00	Prime
X989	ENH: SZ TRUNKING OPERATION	$	4,700.00	Prime
DS58104	SWITCH MODULE A B ONLY	$	413.00	Prime
DS58044	CONTROL MODULE WITH CONTACT	$	1,307.00	Prime
DS580330	POWER SUPPLY 115VAC	$	1,485.00	Prime
CLN1195	SWITCH FOR REDUNDANTTRNK CO	$	2,750.00	Prime
D179CE	ADD: MTC 3600 SIMUL REM SPARES	$	2,615.00	Reservoir
D179CE	ADD: MTC 3600 SIMUL REM SPARES	$	2,615.00	T41
DQBMR10HB1	ANT 13.4 DB GAIN PEANUT	$	4,435.00	Fire Sta 2
DQBMR12HB1	ANT 15.4DB PEANUT 806-869	$	7,884.00	Fire Sta 2
DQBMR12OB1	12 DB GAIN OMNI ANTENNA	$	7,696.00	Fire Sta 2
DS7390112D05	MULTICOUPLER	$	8,800.00	Fire Sta 2
DDF1001	16 PORT AUTOQUAD TWR TOP MULTI	$	12,724.00	Fire Sta 2
C99ED	QUANTAR/QUANTRO FAMILY	$	6,776.00	Fire Sta 2
001C	QUANTAR STATION	$	-	Fire Sta 2
X750	ADD: 800 MHZ BAND RX 806-825 MHZ/TX	$	6,314.00	Fire Sta 2
X888	ADD: GPS SIMULCAST	$	1,000.00	Fire Sta 2
X889	ADD: ASTRO W/L INTFC V.24	$	500.00	Fire Sta 2
X897 A	ENH: SZ6809 ASTR CAI TRK QTAR	$	2,750.00	Fire Sta 2
F4540	NFM RTU WITH I/O 48VDC	$	4,200.00	Fire Sta 2

ADDENDUM 1
800 MHz TRUNKED DIGITAL SIMULCAST RADIO SYSTEM, DIGITAL MULTIPLEX, TOWER, SHELTER, AND SERVICES FOR CITY OF MIAMI BEACH, FLORIDA

Nomenclature/Option	Description		Unit Price	Location
V261	ALT: 110/220V 3A TO 8A	$	303.00	Fire Sta 2
V346	ADD: 120V 3A + 5A/H BAT ON 19I	$	660.00	Fire Sta 2
F4545	NFM RTU MULTIPORT 48VDC	$	2,000.00	Fire Sta 2
V426	ADD: NFM CPU	$	1,200.00	Fire Sta 2
F4545	NFM RTU MULTIPORT 48VDC	$	2,000.00	Fire Sta 2
F6977	MOSCAD ACCESSORY	$	-	Fire Sta 2
V184	ADD: RS232 MULTIPLEXER	$	290.00	Fire Sta 2
V186	ADD: RS485 JUNCTION BOX	$	95.00	Fire Sta 2
V440	ADD: RS485 3 METER CABLE	$	17.00	Fire Sta 2
F5999ASP15511	POWER BRIDGE FOR DC DISTRIBUTION, O	$	290.00	Fire Sta 2
DSAPEXMOV120W	208/120 VAC, 3 PHASE. 50KA MOV.	$	2,180.00	Fire Sta 2
DSAPEX4120WM	208/120 VAC, 3-PHASE. 10KA SADS PRI	$	5,451.00	Fire Sta 2
D179CE	ADD: MTC 3600 SIMUL REM SPARES	$	2,615.00	Rebecca
T5589	ASTRO TAC SATELLITE RECEIVER	$	2,750.00	Rebecca
X144	ALT: WIRELINE INTERFACE 8 WR	$	200.00	Rebecca
X317	ADD: TUNING SCREW COVERS	$	-	Rebecca
X600	ADD: RECEIVER, SATELLITE, 800 MHZ	$	1,595.00	Rebecca
X897 C	ENH: SZ6809 ASTR CAI TRK RCVR	$	1,200.00	Rebecca
	Total	**$**	**229,953.00**	

Exhibit G Coverage Prediction

Exhibit G

Coverage Prediction

Coverage Prediction Report

Methodology

System coverage prediction is based on knowledge of the propagation of radio signals, and the ways in which they are attenuated as they travel through the atmosphere, over terrain, through trees, around buildings, and around various obstacles. Predicted coverage is dependent on parameters of both the system and the environment. The major factors are listed below:

System Factors
- Transmitter Power
- Receiver Sensitivity
- Antenna Gains
- Transmission Line Loss
- Antenna Height

Environmental Factors
- Noise
- Tree Density
- Buildings
- Terrain Variations
- Atmospheric Conditions

These parameters are included in the system gains and losses that yield the signal strength (and coverage) at the desired locations. To accomplish the task of coverage prediction, theoretical coverage models have been computerized to provide predictions that are more accurate. Several theoretical models have been tested by Motorola and have been found to be useful in predicting coverage. Our calculations are based upon models that are described in the following references:

Radio Propagation for Vehicular Communications," Kenneth Bullington, IEEE Transactions on Vehicular Technology, Volume VT-26, Number 4, November 1977.

"Field Strength and It's Variability in VHF and UHF Land-Mobile Radio Service," Yoshihisa Okumura, Review of the Electrical Communication Laboratory Volume 16, Number 9-10, September and October 1968.

MOZAIK Coverage Prediction Tool

To arrive at the predicted coverage, the system and environmental parameters are determined for your system by a Motorola Field Engineer familiar with your tertian and environmental conditions. The Motorola Field Engineer then uses the Motorola propagation program MOZAIK.

The MOZAIK program gets its name from the ability to compute coverage on separate tiles rather than along a finite number of radials. Propagation "layers' can also be computed and observed separately. Thus, the tiles and layers make up propagation mosaic. MOZAIK utilizes a topographical database that has been generated by the U.S. Geological Survey.

The MOZAIK program has the ability to use the full USGS (United States Geodetic Survey) 3 arc second database resolution on a tile basis when required. The increased resolution and the MOZAIK method of tiling provide an extremely accurate and timesaving coverage model. In addition, the Field Engineer utilizes the Motorola Simulcast Simulator that provides an analysis of audio quality and capture/delay effects from simulcasting two or more sites. Motorola has determined that simply illustrating overlapping coverage from multiple simulcast sites does not provide an accurate indication of simulcast coverage. Overlapping coverage from several sites increases reliability but can decrease audio quality. The Simulcast Simulator is a powerful tool for the Motorola Systems Engineer to determine the optimum location of simulcast sites, which will provide DAQ-3.4 (Delivered Audio Quality 3.4) level for simulcast systems. The Mozaik Simulcast Simulator is a powerful tool for the Motorola Systems Engineer to determine the optimum location of simulcast sites for the City of Miami Beach.

Unfortunately, even the best database can contain a certain amount of errors. These errors can be caused by a number of factors such as:

- Source Information - Terrain and environmental databases are primarily derived from existing government map information so it is expected that minor errors may occur. Consequently, any errors in the database will be carried over to the maps.

- Database Development Process - The process of creating digitized map information involves both sophisticated computer technology and human participation. Each has the potential for introducing errors into the databases. Limitations in the digitizing algorithms and computer hardware problems are just two examples of potential error sources. In addition, as part of the process, the database developer is required to make a certain amount of judgment calls, which could lead to errors. Fortunately, most errors are caught during the data verification phase. However, certain errors may not be detected and can be incorporated in the database.

- Age - The physical world is constantly changing. Natural phenomena such as earthquakes, volcanoes, fires, storms, etc., change the topography and environmental factors. Over time, landfills are created; hills are leveled; roads are built; communities are developed; and large buildings are constructed. Not all of these changes may be captured in the database.

Consequently, any coverage prediction offered by Motorola is limited to the location where the database accurately depicts the terrain and environmental conditions along the path between the transmitter and receiver.

The Field Engineer examines the results to verify the accuracy of the computer output based on knowledge of the application and the environmental conditions. Motorola has Field Engineers based in South Florida that have successfully implemented many of the Motorola trunking systems currently in operation. This understanding of the local environment is critical to coverage prediction. The proposed system for the City of Miami Beach has been designed by resident field

engineers who know how Motorola's product line can be applied to best meet the Public Safety communication for the city.

Coverage Reliability

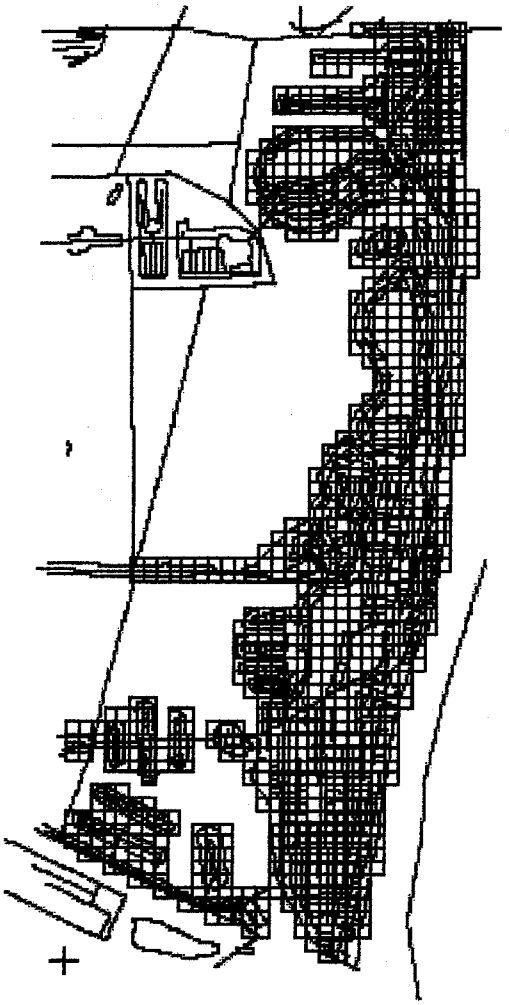
Since no system coverage can be 100% reliable there will always be particular times and locations where signal strength is below that needed for satisfactory performance. These locations of unsatisfactory performance are often predicted in a coverage study. However, the coverage study is not there are areas that cannot be predicted due to greater than average tree density, building density, noise, atmospheric conditions, or terrain variations not accounted for in the reference data.

Since these conditions exist and signals fade due to these environmental and terrain factors, coverage must be described statistically in the terms of a percentage of locations that exhibit reliable communications. Reliability of the signal strength is given in percentage within the coverage area predicted. A system predicted to have 97% area coverage reliability is 97% reliable within the area encircled by the coverage contour.

For this proposal, Motorola has included two coverage maps, Talk-in and Talk-out, that depict 95% Contour and 97% area coverage for the locations enclosed within the Miami Beach jurisdiction. The Talk-in map predicts coverage from a XTS3000 Portable with Public Safety Microphone worn at the shoulder transmitting from within a Large Building (18 dB loss or less loss). The Talk-out map predicts coverage from a XTS3000 Portable with the standard ½ λ antenna worn at hip level receiving while in a Large Building.

For example, if the area is divided uniformly into 600 locations, then 97% of these locations are predicted to provide the CATP Target Signal Level or better and 3% of these location would provide worse than the CATP Target Signal Level . It should be clarified here that an actual verification of satisfactory coverage performance must be based on a larger number of locations consistent with good statistical practice. The CATP (Coverage Acceptance Test Plan) for the City Miami Beach would contain over 600 grid locations evenly distributed over the entire jurisdiction as depicted on the coverage maps. Any grid that shows the predicted reliability of less than 97% on the coverage maps shall not be included in the CATP. An example of the CATP grid map is shown on the following page.

Example City of Miami Beach CATP Grid Map



Over 600 Grids at 0.125 x 0.125

Circuit Merit

Motorola has accounted for the users being in dynamic situations and adjusted our prediction to provide for DAQ-3.4 (Delivered Audio Quality-3) performance in a moving faded environment. Audio quality level DAQ-3.4 in a faded environment requires a higher signal level than in a stationary condition. The industry standard CM and the Motorola DAQ audio charts are listed below.

Delivered Audio Quality	Grade of Circuit Performance
DAQ 1	Unusable, Speech present but unreadable
DAQ 2	Understandable with considerable effort Frequent repetition due to Noise/Distortion
DAQ 3	Speech understandable with slight effort. Occasional repetition required due to Noise/Distortion
DAQ 3.4	Speech understandable without repetition Some Noise/Distortion
DAQ 4	Speech easily understood Occasional Noise/Distortion
DAQ 4.5	Speech easily understood Infrequent Noise/Distortion
DAQ 5	Speech easily understood.

Circuit Merit	Grade of Circuit Performance
CM 1	Speech is not perceptible Signal not present or present less than half the time
CM 2	Speech is understandable only with considerable effort Frequent repetition required for intelligible conversation
CM 3	Speech is understandable with slight effort Occasional repetitions required for clarification.
CM 4	Speech is easily understandable with some continuous noise
CM 5	Speech is perfectly understandable with negligible noise

Simulcast Coverage Performance

Motorola predicts simulcast coverage using a method that aggregates signal strength (signal to noise) and audio phase angle (delay) throughout the complete predicted coverage area. All areas within the predicted coverage contour are analyzed for the combined effect of signal strength and phase angle from all simulcast transmitters in the system. Any area that exhibits an aggregate of signal strength and phase angle that falls below the audio circuit merit and reliability is identified in the coverage predictions and noted as an area of less than acceptable performance.

System Configuration and Antenna Sites

The predicted coverage maps are based on the availability of the sites located at the coordinates specified below and with the antenna site parameters shown below.

Antenna Site Locations

Site Number	Site Name	Location	Ground Elevation	Ground Structure
1a	Reservoir Rx	25° 51' 35.5" N, 80° 7' 34.4" W	6.6 Feet	250 Feet
1b	Reservoir Tx	25° 51' 35.5" N, 80° 7' 34.4" W	6.6 Feet	230 Feet
2a	Tower 41 Rx	25° 48' 52.3" N, 80° 7' 33.1" W	3.9 Feet	220 Feet
2b	Tower 41 Tx	25° 48' 52.3" N, 80° 7' 33.1" W	3.9 Feet	220 Feet
3a	Fire Station 2 Rx	25° 47' 58.3" N, 80° 7' 52.1" W	4.9 Feet	200 Feet
3b	Fire Station 2 Tx	25° 47' 58.3" N, 80° 7' 52.1" W	4.9 Feet	220 Feet
4	Rebecca Towers Rx	25° 46' 12" N, 80° 8' 20" W	3.3 Feet	135 Feet

Antenna Site Equipment Parameters

The effective receiver sensitive incorporates the gains and losses of the antenna; tower mounted amplifier, transmission line, multi-coupler, and receiver sensitivity.

Item	Parameter
Quantar Power	100Watts
Quantar Sensitivity	-117.4dBm

Site 1: Reservoir

Item	Receive
Antenna Height	250Feet
Site HAAT	6.6 Feet
Antenna Mounting	Tower Top
Antenna Gain	13.3dB Omni Pattern
Item	Transmit
Antenna Height	230Feet
Site HAAT	6.6 Feet
Antenna Mounting	Tower Side
Antenna Gain	13.3dB Omni Pattern

Site 2: Tower 41

Item	Receive
Antenna Height	215 Feet
Site HAAT	3.9 Feet
Antenna Mounting	Roof Top
Antenna Gain	13.4dB H Pattern
Item	Transmit
Antenna Height	215 Feet
Site HAAT	3.9 Feet
Antenna Mounting	Tower Side
Antenna Gain	15.4dB H Pattern

Site 3: Fire Station 2

Item	Receive
Site HAAT	180Feet
Antenna HAAT	4.9 Feet
Antenna Mounting	Tower Side
Antenna Gain	13.4dB H Pattern
Item	Transmit
Antenna Height	200Feet
Site HAAT	4.9 Feet
Antenna Mounting	Tower Top
Antenna Gain	13.4dB H Pattern

Site 4: Rebecca Towers

Item	Receive
Antenna Height	130Feet
Site HAAT	3.3 Feet
Antenna Mounting	Roof Top
Antenna Gain	13.3dB Omni Pattern

Portable Radio Configuration:

Portable antenna performance can vary widely depending on the type of antenna used and the location of the portable antenna on the user's body. The coverage maps included for portable radios show the coverage predicted for a 3Watt ASTRO XTS 3000 portable unit using a Public Safety Speaker Microphone antenna.

Talk-in Portable Radio Configuration	Parameter
Portable Power	3Watts
Portable Antenna Type	Public Safety Speaker Microphone Antenna worn at the shoulder level
Effective Radiated Power ERP	27.3dBm

Talk-out Portable Radio Configuration	Parameter
Portable Sensitivity	-119.0dBm
Portable Antenna Type	Standard ½ λ Antenna worn at hip level
Effective Portable Sensitivity	-109.0dBm

General Building Type Definition

The building loss used in this coverage prediction for the City of Miami Beach is 18db. This is referenced to the general description of a large building. Any area within a building that exceeds 18dB of shall be excluded from the coverage guarantee without regard to the building type.

- Large: Buildings with 11dB to 18dB of loss. Large downtown building, large commercial building, emergency shelters, or large enclosed shopping malls (3 stories or more).
- Medium: Buildings with 6dB to 11dB of loss. Small to medium size stores, small apartment buildings, or a small to medium size factory or office buildings (less than three stories)
- Light: Buildings with 0dB to 6dB of loss. Residential buildings (1 and 2 story houses) and other small commercial buildings

The coverage predictions for building locations do not include locations such as elevators; basements below ground level, tunnels, bank vaults, x-ray rooms, and other locations shielded by metal walls or with heavy construction and with no windows or doors. Since building loss can vary significantly depending on the construction of the building, the coverage maps do not predict nor grantee coverage within any specific type of building.

If coverage is required within a specific building, then a field survey will be necessary after system implementation and optimization to determine the specific losses associated with the structure. In buildings exceeding 18dB of loss where coverage is required over a defined area, a passive antenna system or active Bi-Directional Amplifier (BDA) system can be employed to resolve the coverage problem. Motorola will provide quotations for the equipment and installation to the City of Miami Beach as required.

3.4 Radio Communications Coverage

3.4.1 Coverage Reliability

The Proposer shall supply coverage maps to depict 97 percent area coverage for the locations enclosed within the predicted coverage contour for portable and mobile radio coverage.

Coverage maps shall be provided for mobile and portable configurations. For the purpose of coverage performance testing, the worst case of the portable in-building talk out or talk back configuration shall be confirmed. The Contractor and the City shall mutually agree on the performance depicted in the coverage prediction.

3.4.2 Received Signal and Circuit Merit

The Contractor must account for the users being in dynamic situations and adjust their prediction to provide for DAQ 3.4 performance in a moving faded environment using TIA/EIA TSB-88 methodology. DAQ 3.4 level audio quality in a faded environment requires more signal than in a stationary condition. Below is the TIA TSB-88 standard DAQ audio chart:

LEVEL (TIA TSB-88)	Description (TIA-TSB88)	SINAD equivalence
DAQ-1	Unusable, speech present but unreadable.	Less than 8 dB
DAQ-2	Understandable with considerable effort. Frequent repetition due to noise/distortion.	12 +/- 4 dB
DAQ-3	Speech understandable with slight effort. Occasional repetition required due to noise/distortion.	17 +/- 5 dB
DAQ-3.4	Speech understandable with repetition only rarely required. Some noise/distortion.	20 +/- 5 dB
DAQ-4	Speech easily understood. Occasional noise/distortion.	25 +/- 5dB
DAQ-4.5	Speech easily understood. Infrequent noise/distortion.	30 +/- 5 dB
DAQ-5	Speech easily understood.	Greater than 33 dB

3.4.3 Simulcast Coverage Performance Prediction

The Contractor shall predict simulcast coverage using TIA TSB-88 methodology which aggregates signal strength (signal to noise) and simulcast delay spread throughout the complete predicted coverage area. All areas within the predicted coverage contour are to be analyzed for the combined effect of signal strength and simulcast delay spread from all simulcast transmitters in the system. Any area that exhibits an aggregate of signal strength and delay spread that falls below that required for audio circuit merit and reliability shall be identified in the coverage predictions and noted as an area of less than acceptable performance.

3.4.4 System Configuration/Antenna Sites

Site #	Site Name	Location Coordinates	Ground Elevation (Feet)	Structure Height (Feet)
1	Rebecca Tower Receive Only	25° 46`' 12" N 80° 08' 20" W		135
2	Fire Station Two	25° 47`' 58.3" N 80° 07' 52.1" W	4.9	200
3	Tower 41	25° 48' 52.3" N 80° 07' 33.1" W	3.9	215
4	75th Street	25° 51' 35.5" N 80° 07' 34.4" W	6.6	250

3.4.5 Equipment Parameters

3.4.5.1 General Parameters Subscriber Equipment

The parameters are as follows:

A.	Mobile power	35 watts (Public Safety)
B.	Mobile antenna type	3 dB
C.	Portable power	3 watts
D.	Portable ant type (1)	1/2-wave end or center fed, whip (Worst case talk out)

E. Portable ant type (2) — Public safety speaker mic. ant. (worst case talk back)

F. Faded Mobile Sensitivity — (DAQ 3.4)

G. Faded Portable Sensitivity — (DAQ 3.4)

3.4.6 Antenna Site Equipment Parameters

Site # 1 – Rebecca Tower (Receiver Only)

Parameter	Transmit	Receive
Antenna Height	na	135 feet
Antenna Mounting	na	Roof
Antenna Gain	na	12.0 dB

Site # 2 - Fire Station Two

Parameter	Transmit	Receive
Antenna Height	200 feet	180 feet
Antenna Mounting	Top	Side
Antenna Gain	12.0 dB	13.4 dB
ERP	580 watts (preliminary, as licensed)	

Site # 3 – Tower 41

Parameter	Transmit	Receive
Antenna Height	215	215
Antenna Mounting	Roof	Roof
Antenna Gain	13.4 dB	13.4 dB
ERP	980 watts (preliminary, as licensed)	

Site # 4 – 75th Street

Parameter	Transmit	Receive
Antenna Height	250	230
Antenna Mounting	Top	Side
Antenna Gain	12.0 dB	12.0 dB
ERP	525 watts (preliminary, as licensed)	

3.4.7 Mobile Radio Configuration

The coverage maps included for mobile radios are to show the coverage predicted for a 35 watt mobile radio unit. This prediction shall be based on the mobile radio being installed in standard automobiles that are approximately five feet in height. For purposes of modeling coverage, the mobile antenna should be mounted on the roof of the vehicle.

3.4.8 Portable Radio Configuration

Portable antenna performance can vary widely depending on the type of antenna used and the location of the portable antenna on the user's body. The coverage maps included for portable radios must show the coverage predicted for a 3 watt portable unit using a 1/2-wave flexible whip antenna at hip level and a 3 watt portable unit using a public safety speaker microphone antenna. Base to portable talk out coverage shall be analyzed with the portable unit at hip level using the 1/2-wave flexible whip. Portable to base talk back coverage is analyzed with a public safety speaker microphone antenna.

3.4.9 Inside Building and On-Street Coverage

The City of Miami Beach digital simulcast system shall be guaranteed to provide an 18 dB margin to meet the minimum requirements of heavy building coverage.

Building Type Definition:

Heavy: Large downtown building, large commercial building, condominium, hotel. or large enclosed shopping mall (four stories or more). Loss is typically 18 dB or more.

Medium: Small to medium size stores, small apartment buildings, or a small to medium size factory or office buildings (less than four stories). Loss is typically 11 dB or more.

Light: Residential buildings (one and two story houses) and other small commercial buildings. Loss is typically 6 dB or more.

3.4.10 Coverage In Specific Buildings

Except as specifically noted, the coverage prediction for "in building" locations need not include locations such as elevators, basements below ground level, tunnels, bank vaults, and other locations shielded by metal walls or with heavy construction and with no windows or doors. Since building loss can vary significantly depending on the construction of the building, the coverage maps need not predict coverage within any

specific building. If coverage is needed in a specific building, then a field survey will be conducted.

The City has specifically addressed, in the SOW, coverage requirements for several buildings. These buildings are:

A. Mt Sinai Hospital (provide BDA as necessary).

B. South Shore Hospital (provide BDA as necessary).

C. Police Headquarters, 1100 Washington Ave (provide BDA as necessary).

D. Fountainbleu Hilton Hotel (verification only).

With the three-site simulcast system, the Contractor shall guarantee coverage into the specific buildings listed above, with the exception of Fountenbleu Hotel, where verification of a hotel-owned internal BDA system performance will be performed at no risk to the Contractor.

In each of these structures, the testers shall test only in the ground level floors and emergency room locations unless otherwise stated. A minimum of 25 tests shall be performed in random locations throughout each structure.

A passing score will be 97 percent. If a structure fails any tests during the initial minimum of 25 test locations, the test regimen shall be increased to 100 locations. A passing score will be 97/100 locations.

3.4.11 Coverage Acceptance Test Plan

This Coverage Acceptance Test plan is designed to demonstrate that the RF coverage for units proposed to the City will meet the reliability requirement as agreed to by the City and the Contractor. A quantitative method of measurement will be used which involves the use of a calibrated test receiver, analog to digital converter, a portable computer, and a Global Positioning System (GPS) receiver. The GPS receiver will be used to determine the latitude, longitude, and speed of the test vehicle. The computer will be loaded with a mapping database that includes local streets, rivers, railroads, and other features. The computer will save the measured data for each grid that has been defined.

This test will be used to evaluate coverage provided by the proposed system for units in the following configurations:

A. Base to portable talk out to a unit with flex antenna at hip level inside 18 dB buildings.

The automated test shall simulate the conditions above through the use of the adjusted ATP target level in the table below.

B. Portable to base talk in from a unit with a public safety speaker mic. antenna.

The Contractor shall provide a report based upon extrapolation of the collected data to simulate the conditions of portable talk back. If known conditions of outside interference to fixed receivers exist, they shall be indicated in the report for discussion with the City. The effects of such interference shall be reported, but will not be considered for the evaluation score.

The system shall be tested in the IMBE digital mode of operation.

The acceptance criteria will be based on the demonstration that a signal **equivalent to - DAQ 3.4** is available at an digital receiver input. This portion of the test will determine the RF signal levels within City. Uniformly distributed grids will be evaluated over the coverage areas described above. Ninety-seven percent of the grids tested must yield the required ATP target signal level. **(See calculation of ATP Target for inside 18 dB buildings, in the following tables.)**

Configurations outlined above will be evaluated based upon reference field intensity measurements acquired by the calibrated measurement equipment. The test set shall be based on a calibrated test receiver inside a vehicle with a 1/4-wave antenna mounted on the outside center of the roof of the vehicle. During the field test, the automobile will travel to each of the test locations. At each location, outbound signal level measurements will be captured by the calibrated measurement equipment and these measurements will be used as reference levels upon which all other levels will be determined. During the analysis phase, the value for each configuration will be obtained through extrapolation to compensate for any system gain differences between the test equipment and each of the configurations to be evaluated.

Raw test data shall be provided to the City for independent analysis by the City's consultant. The raw test data shall contain the following:

A. Longitude and latitude of each test grid.

B. Raw data string of all RF signal samples or mean RF signal level and standard deviation corresponding to each test grid.

The file format may either be a text (.txt), (.xls), or other format importable into an EXCEL spreadsheet.

The following table indicates the values to be used to determine the ATP target reference signal level for each configuration. These represent the difference in system

gain between the calibrated measurement equipment and each of the configurations. These values will be used in the analysis phase to evaluate acceptance.

Digital C4FM IMBE DAQ 3.4 Signal Threshold

Portable Antenna Degradation Relative To Mobile Test Digital C4FM IMBE Faded Mobile Sensitivity (DAQ 3.4 = 2.0%/16.2dB) = -106.3 dBm *		
	SMA	**Flex Whip at Hip**
Mobile antenna degradation	-1.0 dBd	-1.0 dBd
Mobile line loss	-1.8 dB	-1.8 dB
Portable antenna factor	+7.5 dBd	+10.9 dBd
Adjusted portable antenna factor	(+4.7 dB)	(+8.1 dB)
Receiver faded sensitivity (DAQ 3.4)	-106.3 dBm	-106.3 dBm
Adjusted portable antenna factor	+4.7 dB	*+8.1 dB*
Portable with SMA outside (DAQ 3.4)	(-101.6 dBm)	(-98.2 dBm)
Portable in heavy 18 dB buildings		
Receiver threshold (DAQ 3.4)	-101.6 dBm	-98.2 dBm
Heavy 18 dB building factor	+18.0 dB	+18 dB
Portable in heavy building (DAQ 3.4)	(-83.6 dBm)	**(-80.2 dBm) ATP Target For talk out.**

Digital EDACS FM IMBE DAQ 3.4 Signal Threshold

Portable Antenna Degradation Relative To Mobile Test Digital FM IMBE Faded Mobile Sensitivity (DAQ 3.4 = 2%/15.7 dB) = -107.6dBm *		
	SMA	**½ Wave Whip at Hip**
Mobile antenna degradation	-1.0 dBd	-1.0 dBd
Mobile line loss	-1.8 dB	-1.8 dB
Portable antenna factor	+10.0 dBd	+10.0 dBd
Adjusted portable antenna factor	(+7.2 dB)	(+7.2 dB)
Receiver faded sensitivity (DAQ 3.4)	-107.6 dBm	-107.6dBm
Adjusted portable antenna factor	+7.2 dB	+7.2 dB
Portable with SMA outside (DAQ 3.4)	(-100.4 dBm)	(-100.4 dBm)
Portable in heavy 18 dB buildings		
Receiver threshold (DAQ 3.4)	-100.4 dBm	-100.4 dBm
Heavy 18 dB building factor	+18.0 dB	+18 dB
Portable in heavy building (DAQ 3.4)	(-82.4 dBm)	**(-82.4 dBm) ATP Target For talk out.**

3.4.12 Coverage Testing Methodology

A. This test will be an RF signal strength measurement test using a calibrated mobile receiver to measure raw outbound signal from the simulcast base stations.

B. Computers provided by the Contractor in the automobile will be used to gather signal strength data.

C. The City will provide the vehicles used for the test.

D. An antenna will be connected to the antenna port of a calibrated Contractor-supplied test receiver monitoring the transmission from a repeater at each base station radio site. The antenna will be mounted on the outside center of the automobile roof. An analog to digital converter device will be connected between the signal strength indicator port of the mobile and the computer. A computer program will manage each gathering session and store the collected data on disks for later analysis. Following the completion of each day's test session, a digital copy of the drive test data shall be provided to the City or its consultant.

E. A quasi-random method of selecting evenly and uniformly distributed test locations will be used. The indicated required coverage areas will be divided into evenly distributed grids. The computer will display the grid structure as described, and overlay it on the screen on top of a base map showing the roads. The computer will provide a visual indication that data has been collected in a grid.

F. Signal strength at each location will be determined by taking 500 evenly timed data measured over a distance of 40 wavelengths. The average of these measurements will be computed to determine a signal level representative of the test location. An average of multiple samples is used rather than a single measurement to ensure that the measurement is not biased by taking a single sample that might be at a peak or null point on the radio wave. The resulting average will be referred to as the "Reference Grid Level."

G. The "ATP Target Reference Level" will be used, and through extrapolation, receive signal levels will be determined for each of the test configurations. For a particular configuration, if the receive signal level is equal to or greater than the ATP Target Reference Level, then the grid for that configuration will be declared passed. If the extrapolated receive signal level is worse than the ATP Target Reference Level then the grid for that configuration will be declared failed. If 97 percent of the grids are determined to be passed grids for a particular configuration, the coverage for that configuration will be declared passed. The successful passing of each of the configurations will constitute the criteria for RF signal strength coverage acceptance.

3.4.13 Prerequisites and Preparation

One automobile and driver supplied by the City will be utilized for this test. The Contractor will provide the calibrated measurement equipment for the test. The Contractor will conduct the testing procedures. A representative for the City will accompany the test team, and the team members will be determined by the City prior to the testing.

3.4.14 Analyzing Data and Report Generation

During the field test, a computer file is generated which includes the signal level averages for each test location. This data will be placed in a computer spreadsheet during the analysis phase and summaries will be computed for each of the test configurations.

A report outlining the test and test results will be submitted to the City. The time frame for the report submission will be agreed to by City and the Contractor.

The successful completion of the automated coverage test will demonstrate sufficient signal strength to provide 18 dB building coverage throughout 97 percent of the area within the City.

3.4.15 Manual Delivered Audio Quality (DAQ) Test

It is generally accepted that digital audio quality is affected by a number of factors. The most significant are the signal strength and channel bit error rate (BER). While the automated test could measure BER in an automated method, it would be necessary to attenuate all of the system margin in the mobile test package. However, this still would not accurately portray the real operating environment. Therefore, a manual DAQ test will be performed.

Separate manual portable radio talk out and talk back tests shall be conducted for selected indoor locations within the City coverage area. The portable radio with speaker-microphone-antenna (SMA) worn on the lapel shall be tested for talk in (portable to base) and a portable at hip level shall be tested for talk out (base to portable).

The methodology of the delivered audio quality tests will be based upon the TIA TSB88 subjective descriptions. A two-way test message will be transmitted at each test location and recorded by each listener. During the tabulation, the messages will be checked for accuracy. Successful transmission of the test message will be the sole evaluation criterion for the manual DAQ test.

Successful completion of the manual DAQ test will demonstrate the proper operation of the digital simulcast system with respect to RF faded signal thresholds and bit error tolerance.

Buildings in each grid will be tested through the transmission of a standardized test message. Buildings failing the test will be later evaluated to determine the building loss by measurement of the available signal strength outside of the building and comparing it to the signal strength measured within the building. A building which fails the DAQ 3.4 test shall be included in the test scoring if the building loss is found to be 18 dB or less. A building which fails the DAQ 3.4 test shall be excluded from the test scoring if the building loss is found to be greater than 18 dB. In this case, the City may select an alternative building in the same grid for later testing, as the initially selected building demonstrates a loss of more than 18 dB.

Building losses will be established by measuring the signal outside a building and a signal measured inside a building. Measurements outside buildings will be gathered by placing the automated measuring equipment on a cart or using a handheld signal strength measuring device. The measurement will be along at least three sides of the building being tested (as far as practical limits allow). The mean of these signal measurements will establish the outside signal level. The measurement will then be moved inside the building. At locations where the voice quality test fails, the signal will be measured at that point to obtain the in-building signal strength for that specific test point.

3-19-03> It has been agreed that the exhibit H will include the City of Miami Beach SOW section on coverage testing. Motorola proposes to include the following clarifications:

Building losses (SOW 3.4.15): Building losses will be established by measuring the signal outside a building and a signal measured inside a building. The outside measure will include 4 sides of the building (as long as it is practical) and will be recorded as the average of the two highest readings.

3.4.16 Coverage Performance Guarantee

The Contractor shall guarantee RF coverage performance in accordance with the requirements of this document. A minimum of 97 percent of the test locations shall provide a voice quality of DAQ 3.4 or better as determined by the test methodology set forth in this document. If the RF coverage performance of the simulcast trunked radio system supplied by the Contractor fails to meet the coverage requirements stated in this document, the Contractor shall modify or otherwise cause the system(s) to meet the minimum requirements of this document at no cost (direct or indirect) to the City. If corrections to the system are required, all coverage tests will be repeated as necessary for any portion of the system determined by the City to have potentially been impacted by the correction work done by the Contractor. The City retains the option to require that all coverage tests be repeated in the event that the simulcast system requires modification or repairs during the conduct of any testing.

3.4.17 Test Location

A statistically significant number of buildings shall be randomly chosen as test locations within the grids of the City coverage area. If buildings do not exist within the grid, then the test shall be conducted from inside of a passenger vehicle and duly noted.

Tests will be conducted within typical buildings having 18 dB or less building loss. These are described as heavy density or large type structures.

As described previously, random building locations which demonstrate greater than 18 dB building loss will be excluded as test points if the building fails but will be retained as part of the test results if the building passes.

Test locations within buildings will be selected by the field tester and will fairly simulate locations typically encountered by public safety personnel. By way of example, but not of limitation, tests in apartment complexes will be conducted in the hallways or stairwells of said complexes. No attempt will be made to seek out unusually high-density areas within buildings such as boiler rooms or underground parking areas.

One test location will be selected within each random building. The location will be on the ground level of the building.

Talk in testing will be conducted with the use of a shoulder or lapel microphone with an integral antenna (SMA type) mounted at shoulder level on the exterior of all clothing. The shoulder/lapel microphone and antenna will be connected directly to a portable radio that will be mounted in a belt holster. Additionally a portable with a flex whip antenna will be mounted at hip level for talk out testing.

3.4.18 Test Methodology

A. A "standard test message" is defined as the following sequence and will be evaluated as one DAQ 3.4 test message:

1. Call.
2. Call acknowledgment.
3. In-bound message.
4. Out-bound message.
5. Sign off.

B. The test message will contain the following information:

1. The inbound test message will consist of the words "Test Number" concatenated with the following information:

   a. Grid number.

   b. Decimal point followed by test point within that grid.

   c. Five randomly generated two-digit numbers.

   As examples: "Test Number 345.1, 12, 42, 57, 14, 88" is the first attempt test conducted for the first location in Grid 345; *and* "Test Number 345.2, 13, 45, 58, 17, 89" is the second test attempt conducted for the first location in Grid 345.

C. The outbound test message will consist solely of five randomly generated two-digit numbers.

D. Random numbers will be generated by a computer for each district and submitted to testers and dispatchers immediately before each test day. Neither field testers nor dispatchers will have any knowledge of the other's random test number sequences prior to the test.

E. The tester will sign off with "10-4"

F. If the test message is not clearly received by either the dispatcher or the tester, the test sequence shall be repeated once more; with the tester allowed to move the radio antenna from one side of their body to the other, without changing their location. This shall be flagged on the score sheet as a second attempt. If this second attempt is a pass, the test point passes.

G. If human error or distraction causes a transmission to be missed, the test sequence will be repeated and a notation will be made in the score sheet.

H. The test cycle is complete.

After each day's test session, the original test forms will be delivered to the City's Project Manager. Copies will be made for the City and the Contractor for immediate review.

After all test cycles are completed, the standardized test forms will be tabulated and scored. A completed test cycle must contain the exact random test messages, correlated with the test grid number, to be considered a pass. DAQ 3.4 will be achieved by the reception of the exact random test messages by both the console operator and tester.

Testing will be conducted at a statistically significant number of grid locations (one point per grid) within the City coverage area.

To eliminate possibility of error on the part of the testers, at tabulation, each failed test message will be analyzed for patterns indicative of commonly confused number pairs. For example, the pairs 59 versus 69 and 60 versus 16 are commonly confused. Such number confusion will be corrected during the scoring, provided the error is obvious and is the sole cause of failure of a given test sequence. The successful passing of 97 percent of the tested areas will constitute the criteria for acceptance of the DAQ test. (See Appendix B.)

3-19-03> It has been agreed that the exhibit H will include the City of Miami Beach SOW section on coverage testing. Motorola proposes to include the following clarifications:

a) DAQ test message (SOW 3.4.18): Prior to the start of the DAQ test, Motorola and the City of Miami Beach will revise the randomly generated two-digit numbers of the test messages and analyze them to see if any of these numbers fall under a commonly confused pattern. If they do so, the two-digit pairs will be replaced with new randomly generated pairs. If some pairs escape during the test message preparation phase, the confusion will be corrected during the scoring, provided the error is obvious and it is the sole cause of the test sequence failure.

b) Limited time for DAQ test (SOW 3.4.18): The DAQ test will be limited to a 30-day period including the preparation and analysis phases. Exclusions to this limitation will be reasonable hardships such as: acts of God (war, flood, fire), extreme weather conditions (hurricanes); or communication system failures that impede to continue with the testing.

c) Motorola is willing to accommodate during the DAQ testing phase the removal of one particular site for a period of time (8-12 hours) so that CMB can perform any additional testing for information purposes only. The test cannot be part of the ATP since site redundancy for coverage purposes was not part of the original CMB SOW requirements.

Exhibit H Acceptance Test Plan (Includes all ATP's)

Exhibit H

Acceptance Test Plan (Includes all ATP's)

Factory Acceptance Test Plan

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The following procedures form a set of tests applicable to the City of Miami Beach SmartZone system.

Clarification note: In the SmartZone environment the term **"site"** refers to a sub-system of the SmartZone controller. In this particular case, the City of Miami Beach simulcast system is considered a **"site"** of the SmartZone system. The term is confused sometimes with the RF sites of the City of Miami Beach simulcast sub-system. In this particular case, the Fire Station 2, Tower 41, 75th Street, and Rebecca Tower locations are considered RF sites of the simulcast system.

TRUNKING TESTS

Test 1 - Talkgroup Call

Description

The Talkgroup is the primary level of organization for communications on a trunked radio system. Radios with Talkgroup call capability will be able to communicate with other members of the same Talkgroup. This provides the effect of a private channel down to the Talkgroup level. This test will demonstrate that a Talkgroup transmission initiated by a radio user will only be heard by system users, which have, the same Talkgroup selected. It will be performed in ASTRO Digital mode. As with other types of calls, talkgroup calls can take place from anywhere in the system.

Setup

Four radios, each capable of performing calls on two unique talkgroups, are required to perform this test (Radios 1, 2, 3 and 4). This test requires Radios 1 and 3 to be affiliated to the same site and Radios 2 and 4 to be affiliated anywhere else in the system. Set Radios 1 and 2 to Talkgroup A, and Radios 3 and 4 to Talkgroup B.

Test

Step 1. While the system is in wide area operation, verify that all radios are affiliated as described above.

Step 2. Initiate a call with Radio 1 in Talkgroup A.

Step 3. Observe that only Radio 2 will be able to monitor and respond to the call. Observe that Radio 2 displays the unit ID of Radio 1 in the digital mode. Note: Radios must be properly equipped to display unit ID.

Step 4. Initiate a wide area call with Radio 3 in Talkgroup B.

Step 5. Observe that only Radio 4 will be able to monitor and respond to the call.

TRUNKING TESTS

Test 2 - ASTRO Secure Operation

Description

Digital encryption is used to scramble a transmission so only properly equipped radios can monitor the conversation. A "Key" is used to encrypt the transmit audio. Only radios with the same "Key" can decrypt the audio and listen to it.

Setup

Four radios, each capable of performing secure calls on a common talkgroup, are required to perform this test (Radios 1, 2, 3 and 4). This test requires Radios 1, 2 and 3 to be set in the secure mode of operation while Radio 4 remains in the non-secure mode of operation. All radios should be set to the same talkgroup. Verify the identical key is programmed into Radios 1, 2 and 4 and that Radio 3 has no secure key loaded or has a unique secure key from the other testing radios. The radios may be affiliated to any site in the system.

Test

Step 1. While the system is in wide area operation, verify all radios are on the same talkgroup.

Step 2. Initiate a secure wide area call with Radio 1 on the selected talkgroup. Keep this call in progress until instructed to end the call.

Step 3. Observe that Radio 2 will be able to monitor and respond to the call.

Step 4. Observe that Radio 3 does not receive the call.

Step 5. Observe that Radio 4 will also receive the call even with the secure switch set to the non-secure mode of operation.

Step 6. End the call from Radio 1.

Step 7. For radios equipped with dual algorithm encryption modules, select a talkgroup using the second algorithm and repeat steps 1-5.

TRUNKING TESTS

Test 3 - Multigroup Call

Description

This trunking feature allows an equipped radio user to transmit an announcement to several different talkgroups simultaneously. The multigroup call can be flagged for *Wait Mode* in the Zone Configuration Manager database forcing all attached talkgroups to finish calls in progress before the trunked system will process the multigroup call. The system does not permit inactive, attached talkgroups to initiate talkgroup calls during the "wait" timeframe. Alternatively, the multigroup call can be flagged for *Interrupt Mode* meaning that the trunked system does not wait for attached talkgroups to finish calls in progress. Upon de-keying, the interrupted radios will join the multigroup call in progress. Both the *Wait* and *Interrupt* modes will be demonstrated. As with other types of calls, multigroup calls can take place from anywhere in the system.

Test 3A Multigroup Call For Wait Mode

Setup

Four radios, with one radio capable of performing Multigroup Calls to associated talkgroups, are required to perform this test (Radios 1, 2 , 3 and 4). This test requires each of the radios to be affiliated onto different sites across the system. Set Radio 1 to Talkgroup A, Radio 2 to Talkgroup B and Radio 3 to Talkgroup C. Set Radio 4 to MG1 which has attached Talkgroups A and B. Talkgroup C is not attached to MG1.

Step 1. Verify MG1 is set for the Wait mode in the ZM database.

Step 2. Using Radio 1, initiate a call on Talkgroup A.

Step 3. While Radio 1 is keyed, attempt to initiate a multigroup call using Radio 4 on MG1. Verify Radio 4 receives a busy tone because one of the talkgroups attached to MG1 is involved in a talkgroup call.

Step 4. Dekey Radio 1 and verify Radio 4 receives a callback.

Step 5. Key Radio 4 and verify both Radio 1 and radio 2 hear the multigroup call while Radio 3 does not unmute.

Test 3B Multigroup Call For Interrupt Mode

Setup

Four radios, with one radio capable of performing Multigroup Calls to associated talkgroups, are required to perform this test (Radios 1, 2 , 3 and 4). This test requires each of the radios to be affiliated onto different sites across the system. Set Radio 1 to Talkgroup A, Radio 2 to Talkgroup B and Radio 3 to Talkgroup C. Set Radio 4 to MG1 which has attached Talkgroups A and B. Talkgroup C is not attached to MG1.

Step 1. Verify MG1 is set for the Interrupt mode in the ZM database.

Step 2. Using Radio 1, initiate a call on Talkgroup A.

Step 3. While Radio 1 is keyed, initiate a multigroup call using Radio 4 on MG1. Verify Radio 2 receives the call but Radio 3 does not unmute.

Step 4. Dekey Radio 1 and verify Radio 1 unmutes and joins the multigroup call in progress.

TRUNKING TESTS

Test 4 - Private Call

Description

Private Call is a selective calling feature that allows a dispatcher or radio user to carry on one-to-one conversation that is only heard by the 2 parties involved. Subscriber units receiving a private call will sound an alert tone. As with other types of calls, Private Calls can take place from anywhere in the system.

Setup

Three radios are required to perform this test (Radios 1, 2 and 3). This test requires each radio to be affiliated at different sites throughout the system. Initially verify that all radios have the identical talkgroup selected.

Step 1. While the system is in wide area operation, verify that all radios are affiliated as described above.

Step 2. Using Radio 1, press the Private Call button.

Step 3. Enter the unit ID of Radio 2 with the keypad, or scroll to the location where this ID is stored.

Step 4. Press the PTT to initiate the call.

Step 5. Verify that tones are heard at Radio 2 and that it's display indicates that a call has been received.

Step 6. Answer the call at Radio 2 by pressing the Private Call button. Verify its display shows the ID number of the calling unit.

Step 7. Press the PTT switch on Radio 2 and respond to the call.

Note - If you do not press the Private Call button before pressing PTT, your audio will be heard by all members of the talkgroup, and not by the radio initiating the Private Call.

Step 8. Verify Radio 1 hears the audio from Radio 2 but Radio 3 does not.

Step 9. End the Private Call and return to normal talkgroup operation.

TRUNKING TESTS

Test 5 - Call Alert

Description

Call Alert is a tone page that allows a user to selectively alert another radio unit. The initiating radio will receive notification from the trunked system as to whether or not the page was received by the target radio. Units receiving a Call Alert will sound an alert tone. As with other types of calls, Call Alerts can take place from anywhere in the system.

Setup

Three radios are required to perform this test (Radios 1, 2 and 3). This test requires each radio to be affiliated to a different site in the system. Initially verify that all radios have unique talkgroups selected.

Test

Step 1. While the system is in wide area operation, verify that all radios are affiliated as described above.

Step 2. Using Radio 1, press the page button.

Step 3. Enter the unit ID of Radio 2 with the keypad, or scroll to the location where this ID is stored.

Step 4. Verify that Radio 2 user receives an audible and visual indication of an incoming Call Alert was sent but Radio 3 does not.

Step 5. Verify Radio 1 gets an audible indication that the Call Alert was successfully received at the target radio.

Step 6. Turn off Radio 2. Send a Call Alert from Radio 1 to Radio 2.

Step 7. Verify Radio 1 does not gets an audible indication that the Call Alert was successfully received at the target radio.

TRUNKING TESTS

Test 6 - Emergency Alarm/Call

Description

Users in life threatening situations can use the Emergency button on the radio to immediately send a signal to the dispatcher and be assigned the next available voice channel. The first available channel is assigned and held by the emergency talkgroup. An Emergency Call assignment can be set to either Top of Queue (waits for a channel to become available) or Ruthless Preemption (forces another call to be de-assigned) operation.

Setup

Four radios are required to perform this test (Radios 1, 2, 3 and 4). This test requires Radios 1, 3 and 4 to be affiliated to the same site and Radio 2 to be affiliated to any other site in the system. Initially verify that Radios 1 and 2 have the identical Talkgroup A selected, Radio 3 is on a unique Talkgroup B, and Radio 4 is on a unique Talkgroup C. The emergency type for Talkgroup A must be set up through the User Configuration Manager (UCM) for either Top of Queue or Ruthless Preemption.

Test

Step 1. While the system is in wide area operation, verify that all radios are affiliated as described above.

Step 2. Busy all channels at the site to which Radios 1, 3 and 4 are affiliated with the exception of the control channel and one voice channel (will be the same channel for IR sites with Voice on Control).

If the Emergency type is Top of Queue then:

Step 3. Key Radio 3 and hold the PTT switch until instructed to release.

Step 4. Key Radio 4 and verify the radio receives a busy tone. Release the PTT switch on Radio 4.

Step 5. Using Radio 1 send an Emergency Call by depressing the emergency switch and then the PTT switch.

Step 6. Observe that Radio 1 cannot transmit due to the voice channel being busy but the Emergency Alarm is displayed at a console position monitoring TG A.

Step 7. Release the PTT switch on Radio 3.

Step 8. Observe that Radio 1 receives the call back before Radio 4 and is able to proceed with the call.

Step 9. Observe that Radio 2 denotes an emergency and the unit ID of Radio 1 in the digital mode. Note: Radios must be properly equipped to display unit ID.

Step 10. Dekey Radio 1 and end the Emergency Call by holding down the Emergency button on Radio 1 until an alert tone sounds. Verify Radio 1 returns to normal operation and that Radio 4 receives a callback.

If the Emergency type is Ruthless Preemption for Talkgroup A then:

Step 11. Press the PTT to initiate a call with Radio 3 and hold the PTT switch until instructed to release.

Step 12. Key Radio 4 and verify the radio receives a busy tone. Release the PTT switch on Radio 4.

Step 13. Using Radio 1 send an Emergency Call by depressing the emergency switch and then the PTT switch.

Step 14. Observe that Radio 1 is granted the channel immediately and the talkgroup call is dropped for Radio 3. An Emergency Alarm is displayed at a console position monitoring TG A

Note – While the talkgroup call is dropped, Radio 3 will continue to transmit on the voice channel. Radios 1 and 3 will both be on the same frequency and RF contention will occur.

Step 15. De-key Radio 3 and verify that the TG B call is transmission trunked and RF contention no longer occurs.

Step 16. End the Emergency Call by holding down the Emergency button on Radio 1 until an alert tone sounds. Verify Radio 1 returns to normal operation and that Radio 4 receives a callback.

TRUNKING TESTS

Test 7 - Busy Queuing and Callback with Ten Talkgroup Priority Levels

Description

If no voice channel resources are available, radios requesting channels for new conversations are placed in a queue. Users of the same priority will move through the queue in a FIFO (first in, first out) sequence; however, users of higher priority will be inserted ahead of lower priority users in queue.

When a voice channel becomes available, the radio at the top of the busy queue gets a channel assignment and generates a callback tone. The callback tone alerts the user that a channel assignment was made and transmitting is now possible on the selected talkgroup.

Note – An Emergency Call has the highest priority at level 1. 2 is the highest assignable priority and 10 (default priority level) is the lowest.

Setup

Six radios are required to perform this test (Radios 1, 2, 3, 4, 5 and 6). This test requires Radios 1, 2 and 3 to be affiliated to one site and Radios 4, 5 and 6 to be affiliated to any other site . Set Radios 1 and 4 to Talkgroup A. Set Radios 2 and 5 to Talkgroup B. Set Radios 3 and 6 to Talkgroup C. The Dispatch Priority level for Talkgroups A and C should be the default level of 10. Set the Dispatch Priority level of Talkgroup B to 9 through the User Configuration Manager. The busy condition is created by disabling all channels except the control channel and one voice channel (will be the same channel for IR sites with Voice on Control) at the site to which Radios 1, 2 and 3 are affiliated. All radios must have Busy Over-ride set to Disabled in the Zone Configuration Manager.

Test

Step 1. While the system is in wide area operation, verify that all radios are affiliated as described above.

Step 2. Initiate a Talkgroup Call with Radio 1 and observe that it is received by Radio 4. Keep this call in progress until instructed to end the call.

Step 3. Key Radio 3 and observe that the radio receives a busy.

Step 4. Key Radio 2 and observe that the radio receives a busy.

Step 5. End the Talkgroup Call established in step 2.

Step 6. Observe Radio 2 receives the first callback and can make a call to Radio 5 upon receipt of the callback indication.

Step 7. End the call between Radio 2 and Radio 5.

Step 8. Observe Radio 3 now receives a callback and can make a call to Radio 6 upon receipt of the callback indication.

Step 9. Return all the channels in the system to service.

TRUNKING TESTS

Test 8 - Priority Monitor

Description

The Talkgroup Scan feature enables a subscriber radio unit to automatically monitor specific Talkgroups pre-programmed into the radio for any activity. The radio "listens" on the control channel to see if there is a voice channel assigned for one of the Talkgroups in its scan list. If there is, it will go to the assigned voice channel and monitor the call. A Talkgroup can be assigned a Priority and Non-Priority designation. The scanning Radio will stop monitoring one Talkgroup call and join another if the new Talkgroup call has the higher priority. Note that the radio will scan for Talkgroups only at the site it is affiliated with.

Test 8A - Non-Priority Scan

Setup

Four radios are required to perform this test (Radios 1, 2, 3, and 4). This test requires Radios 1 and 2 to be affiliated to same site and Radios 3 and 4 to be affiliated to any other site in the system. Radio 1 will be set to the scan mode of operation and programmed to scan all Talkgroups. Set Radio 1 to Talkgroup A, Radios 2 and 3 to Talkgroup B and Radio 4 to Talkgroup C.

Test

Step 1. While the system is in wide area operation, verify that all radios are affiliated as described above.

Step 2. Initiate a Talkgroup Call with Radio 3. Verify that Radio 2 hears the call and that Radio 1 scans to the talkgroup and receives the call.

Step 3. Dekey Radio 3.

Step 4. Initiate a Talkgroup Call with Radio 4 and verify that Radio 1 does not receive the call. There are no Radios at that site affiliated with TG C so no site resources are allocated to the call.

Test 8B - Priority Scan

Setup

Five radios are required to perform this test (Radios 1, 2, 3, 4 and 5). This test requires Radios 1, 2 and 3 to be affiliated to same site in the system and Radios 4 and 5 to be affiliated to any other site in the system. Radio 1 is set to Talkgroup A and the scan mode of operation is enabled. Set radios 2 and 4 to Talkgroup B. Set Radios 3 and 5 to Talkgroup C. Designate Talkgroup B as a it Priority Monitor in the User Configuration Manager. Set up a scan list in Radio 1 with all Talkgroups and with Talkgroup B as a Priority Talkgroup.

Test

Step 1. While the system is in wide area operation, verify that all radios are affiliated as described above.

Step 2. Initiate a Talkgroup Call with Radio 5 and keep keyed until the end of the procedure.

Step 3. Verify that Radio 3 hears the audio from Radio 5. Verify that Radio 1 scans to Talkgroup C and also hears the audio from Radio 5.

Step 4. Initiate a Talkgroup Call with Radio 4.

Step 5. Verify Radio 2 hears the audio from Radio 4. Verify that Radio 1 stops listening to Radio 3 and scans to Talkgroup B to listen to Radio 4.

Step 6. Dekey Radios 4 and 5.

TRUNKING TESTS

Test 9 - Automatic retry

Description

Automatic retry is a feature to ensure system access and eliminate the need for a radio user to rekey or remain keyed in an effort to gain a channel. When the radio operator presses the PTT, the radio sends a burst of data to the system central controller via the control channel to request a voice channel. To ensure that the request gets through in the event of weak signal levels or interference, the radio will automatically continue to send a channel request until the request is acknowledged by the central controller or until approximately 4 seconds has passed. Automatic retries are random to minimize contention on the control channel.

Setup

One radio is required with the antenna removed.

Test

Step 1. Key the radio.

Step 2. Verify the transmit indicator on the radio flashes for approximately 4 seconds as the radio retries the PTT request.

Step 3. Rekey the radio and re-attach the antenna.

Step 4. Verify the radio gets a callback.

TRUNKING TESTS

Test 11 - Continuous Assignment Updating

Description

When a talkgroup is assigned a voice channel, the site controller continues to transmit the channel assignment on the control channel for the duration of the talkgroup call. Radios coming into use on the system are automatically sent to voice channels with conversations in progress involving their selected talkgroups.

Setup

Three radios are required to perform this test (Radios 1, 2 and 3). This test does not require any specific site affiliations for the radios under test. Initially verify that all radios have the identical talkgroup selected.

Test

Step 1. Turn OFF one of the radios in the talkgroup or switch it to another talkgroup.

Step 2. Initiate a Talkgroup Call using another radio in the talkgroup.

Step 3. While the Talkgroup Call is in progress, the radio from step 1 is either turned ON or set back to the proper talkgroup.

Step 4. Observe that the radio, which was just brought back into service, joins the Talkgroup Call already in progress.

TRUNKING TESTS

Test 12 - Site Access Control

Description

Note: The term "site" refers to an SmartZone controller site. In this case the City of Miami Beach Simulcast system is considered a "site" of the SmartZone controller.

The User Configuration Manager can be used to limit radio or talkgroup access to selected valid sites. User Configuration Manager flags establish which sites are valid for each individual radio user, talkgroup, and multigroup. An overall Site Access Denial flag for the system governs how these radio and talkgroup settings affect the affiliation or rejection of radios to individual sites. Four possible values for the Site Access Denial flag exist: Individual Only, Talkgroup Only, Either, or Both. Descriptions of these four selections follow:

"Individual Only" Site Access Denial dictates that a radio will not be allowed to affiliate to a particular site if the radio user does not have access to that site. If the Site Access Denial flag is set to "Individual Only", the talkgroup record for valid sites is not used in the determination of actual site affiliation permissions.

"Talkgroup (TG) Only" Site Access Denial dictates that a radio will not be allowed to affiliate to a particular site if its affiliated talkgroup does not have access to that site. In this case, the individual radio user setting for valid sites is not used in the determination of actual site affiliation permissions.

"Either" Site Access Denial indicates that a radio will not be allowed to affiliate to a site if either the radio user or affiliated talkgroup does not have access to that site.

"Both" Site Access Denial indicates that a radio will not be allowed to affiliate to a site only if both the radio user and affiliated talkgroup do not have access to the site.

Test 12A "Individual Only" Site Access Denial

Setup

Two radios are required to perform this test (Radios 1 and 2). Both radios have Talkgroup A selected. With Radio 1 and 2 affiliated at Site 1, set the System Site Access Denial Flag to Individual Only via the User configuration Manager (UCM).

Step 1. Initiate a TG A call from Radio 1. Verify that Radio 1 is allowed to make the TG A call and Radio 2 is monitoring the call.

Step 2. Set Site 1 to be a non-valid site for TG A through the UCM.

Step 3. Verify that Radio 1 is still allowed to affiliate to Site 1 and make the TG A call since the individual Radio user record determines site access.

Step 4. Initiate a Private Call from Radio 1 to Radio 2. Verify that the Private Call occurs since Radio 1 and Radio 2 are valid at Site 1.

Step 5. Set Site 1 to be a non-valid site for Radio 2 through the UCM.

Step 6. Verify that Radio 2 can no longer affiliate to Site 1 and therefore cannot make talkgroup calls since the individual Radio user record determines site access.

Test 12B "Talkgroup Only" Site Access Denial

Setup

Two radios are required to perform this test (Radios 1 and 2). Both radios have Talkgroup A initially selected. Set the System Site Access Denial Flag to Talkgroup Only via the User configuration Manager (UCM).

Step 1. Initiate a TG A call from Radio 1. Verify that Radio 1 is allowed to make the TG A call and Radio 2 is monitoring the call.

Step 2. Set Site 1 to be a non-valid site for TG A through the UCM.

Step 3. Verify that Radio 1 is not allowed to make the TG A call since the talkgroup record determines site access.

Step 4. Initiate a Private Call from Radio 1 to Radio 2. Verify that the Private Call occurs since Radio 1 and Radio 2 are valid at Site 1.

Step 5. Switch Both Radio 1 and Radio 2 to TG B.

Step 6. Verify the TG B is possible since TGB is valid at Site 1.

Test 12C "Either" Site Access Denial

Setup

Two radios are required to perform this test (Radios 1 and 2). Both radios have Talkgroup A initially selected. Set the System Site Access Denial Flag to Either via the User configuration Manager (UCM).

Step 1. Set Site 1 to be a non-valid site for Radio 1 through the UCM. Set Site 1 to be a valid site for TG A through the UCM.

Step 2. Select TG A on Radio 1.

Step 3. Verify that Radio 1 cannot make the TG A call since Site 1 is a non-valid site for Radio 1 and the access is set for "either".

Step 4. Set Site 1 to be a valid site for Radio 1 through the UCM. Set Site 1 to be a non-valid site for TG A through the UCM. These are the opposite settings of Step 1.

Step 5. Verify that Radio 1 still cannot make the TG A call since Site 1 is a non-valid site for TG A and the access is set for "either".

Step 6. Set Site 1 to be a valid site for Radios 1 and Radio 2 through the UCM. Set Site 1 to be a valid site for TG A through the UCM.

Step 7. Verify Both Radio 1 and Radio 2 are set to TG A.

Step 8. Verify that Radio 1 and Radio 2 can make the TG A call since both Radios 1 and Radio 2 and TG A are valid in Site 1.

Test 12D "Both" Site Access Denial

Setup

Two radios are required to perform this test (Radios 1 and 2). Both radios have Talkgroup A initially selected. Set the System Site Access Denial Flag to Both via the User configuration Manager (UCM).

Step 1. Set Site 1 to be a non-valid site for Radio 1 through the UCM. Set Site 1 to be a valid site for TG A through the UCM.

Step 2. Select TG A on Radio 1.

Step 3. Verify that Radio 1 can make the TG A call since Site 1 is a valid site for TG A and the access is set for "both".

Step 4. Set Site 1 to be a valid site for Radio 1 through the UCM. Set Site 1 to be a non-valid site for TG A through the UCM. These are the opposite settings of Step 1.

Step 5. Verify that Radio 1 can still make the TG A call since Site 1 is a valid site for Radio 1 and the access is set for "both".

Step 6. Set Site 1 to be a non-valid site for Radios 1 and Radio 2 through the UCM. Set Site 1 to be non-valid site for TG A through the UCM.

Step 7. Verify both Radio 1 and Radio 2 are set to TG A.

Step 8. Verify that Radio 1 and Radio 2 cannot make the TG A call since both Radios 1 and Radio 2 are not valid in Site 1, and TG B is non-valid in Site 1 and the access is set for "both".

TRUNKING TESTS

Test 15 - Audio Interrupt

Description

A radio PTT request may be received for a group already active and currently being sourced by another radio unit. The Talkgroup can be flagged in the UCM to either allow or disallow the new PTT. If allowed, the latest PTT request will be granted and become the source of the call. If both Radios are at the same RF site, RF contention may prevent either call from working.

Setup

Three radios are required to perform this test (Radios 1, 2 and 3) and they are to be affiliated to Talkgroup A.

Test

Talkgroup Call For Never Interrupt Mode

Step 1. Verify the system is in wide area operation.

Step 2. Set up Talkgroup A for "Never" Interrupt audio mode through the UCM.

Step 3. Using Radio 1, initiate a call on Talkgroup A.

Step 4. Verify both Radio 2 and 3 monitor the audio.

Step 5. Using Radio 3, initiate a call on Talkgroup A.

Step 6. Verify that Radio 2 continues to listen to Radio 1 and Radio 3 gets a rejection tone.

Step 7. De-key both Radios.

TRUNKING TESTS

Test 16 - Recent User Priority

Description

This test verifies that a recent user of the channel has priority over other users of equal priority of being assigned a channel when a busy queue exists. The maximum number of consecutive times that a user may be elevated to recent user priority is two.

Setup

Four radios are required to perform this test (Radios 1, 2, 3 and 4). This test requires Radios 1, 2 and 3 to be affiliated to the same site in any Zone and Radio 4 to be affiliated to any site in any Zone in the system. Initially Radios 1 and 4 are selected to Talkgroup A , Radio 2 is selected to Talkgroup B and Radio 3 is selected to Talkgroup C. Ensure that the priority level for all talkgroups is the same. Busy all channels at the site where Radios 1, 2 and 3 are affiliated with the exception of the control channel and one voice channel (will be the same channel for IR sites with Voice on Control).

Test

Step 1. While the system is in wide area operation, verify the site affiliations and talkgroup selections as described above.

Step 2. Depress and hold the PTT switch of Radio 1.

Step 3. Depress and hold the PTT switch on Radio 2 and then depress and hold the PTT switch on Radio 3. Verify that both radios receive a busy tone.

Step 4. Release the PTT switches on Radios 2 and 3.

Step 5. Release the PTT switch on Radio 1.

Step 6. Depress and hold the PTT switch on Radio 2 after it receives a callback tone.

Step 7. Within 2 seconds of callback, re-key Radio 1. Verify that Radio 1 receives a busy tone.

Step 8. Release the PTT switch on Radio 1.

Step 9. Release the PTT switch on Radio 2. Verify that Radio 1 receives a callback tone before Radio 3.

Step 10. Repeat steps 2-9. Verify that the priority of Radio 1 is once more elevated in the busy queue.

Step 11. Repeat steps 2-9 once more. Verify that in step 9 that Radio 3 receives the callback tone since Radio 1 cannot be elevated in the busy queue more than two consecutive times.

CONSOLE TESTS

Test 1 - Talkgroup Selection and Call

Description

The talkgroup call is the primary level of organization for communications on a trunked radio system. Dispatchers with talkgroup call capability will be able to communicate with other members of the same talkgroup. This provides the effect of an assigned channel down to the talkgroup level. When a talkgroup call is initiated from a subscriber unit, the call is indicated on each dispatch operator position that has a channel control resource associated with the unit's channel/talkgroup. A system may be equipped with infrastructure capable of processing a digital or analog talkgroup call.

Setup

Four radios, each capable of performing calls on two unique talkgroups, are required to perform this test (Radios 1, 2, 3 and 4). This test requires Radios 1 and 2 to be affiliated on the same site and Radios 3 and 4 to be affiliated to another site. Set Radios 1 and 3 on Talkgroup A and radios 2 and 4 on Talkgroup B.

Test

Step 1. While the system is in wide area operation, verify that radios are affiliated as described above.

Step 2. Initiate a wide area call from any operator position on Talkgroup A.

Step 3. Observe that Radios 1 and 3 will be able to monitor and respond to the call.

Step 4. Observe that all Consoles with a Talkgroup A CCW can monitor both sides of the conversation.

Step 5. Initiate a wide area call from any operator position on Talkgroup B.

Step 6. Observe that Radios 2 and 4 will be able to monitor and respond to the call.

Step 7. Observe that all Consoles with a Talkgroup B CCW can monitor both sides of the conversation.

CONSOLE TESTS

Test 2 - Console ASTRO Secure Talkgroup Call

Description

Digital encryption is used to scramble a transmission so only properly equipped radios can monitor the conversation. A "Key" is used to encrypt the transmit audio. Only radios and Consoles/DIUs with the same "Key" can decrypt the audio and listen to it.

Setup

Four radios, each capable of performing ASTRO secure calls on secure console Talkgroups, are required to perform this test (Radios 1, 2, 3 and 4). Set all radios to monitor Talkgroup A. Load identical keys into the DIUs and into Radios 1 and 3. Load no keys into Radios 2 and 4.

Test

Step 1. While the system is in wide area operation, verify that radios are affiliated as described above and all radios are in the non-secure-mode.

Step 2. Initiate a wide area clear call from a operator position with Talkgroup A.

Step 3. Observe that all radios will be able to monitor and respond to the call.

Step 4. Initiate a wide area secure call from the operator position of the console on Talkgroup A.

Step 5. Observe that only Radios 1 and 3 will be able to monitor and respond to the call.

Step 6. If the radios equipped with dual algorithm encryption modules, select a talk group using the second algorithm and repeat steps 4-5.

CONSOLE TESTS

Test 3 - Multigroup Call

Description

This trunking feature allows an equipped console operator position to transmit an announcement to several different talkgroups simultaneously. As with talkgroup calls, multigroup calls operate across sites as well as within the same site.

Setup

Four radios are required to perform this test (Radios 1, 2, 3 and 4). Set Radios 1,2 and 3 to talkgroups that are valid members of the multigroup. Set Radio 4 to a talkgroup that is not a member of the multigroup.

Test

Step 1. While the system is in wide area operation, verify that all radios are affiliated as described above and selected to the proper talkgroups.

Step 2 Select an operator position at the console containing the multigroup tile, which corresponds to the talkgroups, selected on the radios.

Step 3. Select the multigroup tile.

Step 4. Ensure that the talkgroups selected on all radios are members of the same multigroup that is selected at the operator position.

Step 5. Initiate a Multigroup Call from the operator position.

Step 6. Observe that all radios but Radio 4 receive the Multigroup Call.

Step 7. Using one of the radios, answer the Multigroup Call and observe the consoles receives the response.

Note - If the call is answered within the hang time, the console will receive the call on the multigroup tile; otherwise the console will receive the call on the tile associated with the radio's selected talkgroup.

CONSOLE TESTS

Test 4 - Trunking Patch

Description

Talkgroup merge allows a dispatcher to merge several talkgroups together on one voice channel to participate in a single conversation. Using the Patch feature, the console operator can allow the members of a talkgroup to talk or listen to members of other talkgroups. Patched talkgroups can communicate with the console dispatcher and other members of different talkgroups because of the "supergroup" nature of the Patch feature.

Setup

Four radios are required to perform this test (Radios 1, 2, 3 and 4). Initially, Radios 1 and 3 are selected to Talkgroup A and Radios 2 and 4 are selected to Talkgroup B.

Test

Step 1. While the system is in wide area operation, verify that all radios are affiliated and selected to a talkgroup as described above.

Step 2. Select an operator position for testing that has resources for Talkgroups A and B.

Step 3. At the desired operator position select one of the Patch tabs in the Patch/Multi-Select window.

Step 4. Click the button on the patch that allows an operator to setup and edit a patch (note patch window turns blue).

Step 5. Add all the talkgroups to the patch that were selected on the radios above in the setup procedure by selecting each resource tile.

Step 6. Once all talkgroups are added, click the patch setup button again to complete the patch setup.

Step 7. Initiate several Talkgroup Calls between radios.

Step 8. Observe that all radios are able to communicate with one another. Also via Zone Watch observe that at both sites only one RF resource is assigned at the site where Radios 1 and 2 are affiliated.

Step 9. Initiate a call from the operator position using the Patch Transmit and observe that all radios are able to receive the call.

Step 10. Remove all talkgroups from the patch.

CONSOLE TESTS

Test 5 - Multi-Select/APB

Description

Talkgroup merge allows a dispatcher to merge several talkgroups together on one voice channel to participate in a single conversation. This can be used for announcements to two or more channels/talkgroups for general broadcast purposes. One of the types of talkgroup merge available is Multi-Select.

Using the Multi-Select feature, the console operator can talk and listen to all of the selected talkgroups grouped; however, the members of the individual talkgroups cannot talk or listen to members of other talkgroups. Multi-selected talkgroups still only communicate with the console dispatcher and other members in the same talkgroup. A predefined multi-select configuration can be saved by the console operator as an All Points Bulletin (APB) for quick broadcast-type transmissions by the dispatcher.

Setup

Four radios are required to perform this test (Radios 1, 2, 3 and 4). Each radio should be set to different talkgroups A, B, C, D.

Test

Step 1. While the system is in wide area operation, verify that all radios are affiliated as described and note the talkgroup selections on each radio.

Step 2. Select an operator position for testing at the console location, which corresponds to the talkgroups, selected on the radios.

Step 3. At the desired operator position select one of the Multi-Select tabs in the Patch/Multi-Select window.

Step 4. Click the button on the Multi-Select that allows an operator to setup and edit a multiselect (note patch window turns green).

Step 5. Add all the talkgroups (A, B, C, D) to the Multi-Select that were selected on the radios above in the setup procedure by selecting each resource tile.

Step 6. Once all talkgroups are added, click the Multi-Select Setup button again to complete the Multi-Select setup.

Step 7. Initiate a call from the operator position using the APB Transmit and observe that all radios are able to receive the call. Also via Zone Watch, verify that only one RF resource is assigned at a site where multiple radios are affiliated.

Step 8. Remove all talkgroups (A, B, C, D) from the Multi-Select.

CONSOLE TESTS

Test 6 - Console Initiated Private Call

Description

Private Conversation is a selective calling feature which allows a dispatcher or radio user to carry on one-to-one conversation that is heard only by the two parties involved. Subscriber units receiving a private call will sound an alert tone. As with other call types, Private Calls operate across sites as well as within the same site.

Setup

One radio, is required to perform this test (Radios 1). The radio may be set to any talkgroup. Radio 1 can be affiliated onto a site anywhere in the system.

Tes

Step 1. Verify the system is in wide area operation.

Step 2. Select an operator position for testing at either console location.

Step 3. Select the "PRIVATE-CALL" tile.

Step 4. Click the button on the tile that provides the Private Call function.

Step 5. Select the numeric keypad.

Step 6. Using the displayed keypad enter the unit ID to be Private Called.

Step 7. Click the Send button.

Step 8. Answer the Private Call with the radio as done during the trunking test and respond to the console.

Step 9. After completing the Private Call, return to the normal talkgroup mode.

CONSOLE TESTS

Test 7 - Emergency Alarm And Call Display

Description

Users in life threatening situations can use the emergency button on the radio to send an audible and visual alarm signal to a console operator in order to request immediate system access to a voice channel for an emergency call. The emergency alarm is displayed at console operator positions as well as at the Dispatcher.

An emergency alarm begins after the radio user presses the radio's emergency button. Pressing the emergency button places the radio in "emergency mode". To begin an emergency call, the radio user must press the radio's PTT button while in "emergency mode." The assigned voice channel will be dedicated to the emergency caller's talkgroup for an extended period of time, equal to the Message Hang Time plus the Emergency Hang Time. As with other call types, emergency calls can operate across sites as well as within the same site.

Setup

One radio is required to perform this test (Radio 1). Radio 1 to be affiliated to any site and set Radio to Talkgroup A.

Test

Step 1. While the system is in wide area operation, verify that radios are affiliated as described above.

Step 2. Select an operator position in the zone where Radio 1 is affiliated for the test.

Step 3. Initiate an Emergency Alarm from radio 1.

Step 4. Observe the Emergency from Radio 1 is received at the operator position for Talkgroup A.

Step 5. Acknowledge the Emergency at the operator position.

Step 6. Initiate an Emergency call to the operator position with Radio 1 and reply to the radio with the operator position. Observe that the call takes place.

Step 7. Clear the Emergency from the console on Talkgroup A.

Step 8. Reset Radio 1 by holding the Emergency button on the radio.

CONSOLE TESTS

Test 8 - Console Priority

Description

Console operator positions have ultimate control of transmitted audio on an assigned voice channel resource. The console position possesses the capability to take control of an assigned voice channel for a talkgroup call so that the operator's audio overrides any subscriber audio. Console priority is a feature that enables dispatchers to gain immediate access to an assigned voice channel so that a central point of audio control exists.

Setup

Two radios are required to perform this test (radios 1 and 2). This test requires no specific site affiliation of the radios. Set both Radios 1 and 2 to Talkgroup A.

Test

Step 1. Verify that Radios 1 and 2 are setup as described above.

Step 2. Initiate a Talkgroup call from Radio 1 on Talkgroup A.

Step 3. Observe that the call is received by Radio 2.

Step 4. While the call is in progress key up any operator position at the console on Talkgroup A.

Step 5. Observe that Radio 2 is now receiving audio from the operator position.

Step 6. De-key the operator position.

Step 7. Verify Radio 1 audio is now received by Radio 2.

CONSOLE TESTS

Test 9 - PTT Unit ID/Alias Display

Description

Console operator positions contain various resources such as talkgroup, multigroup, Private Call which enable the operator to communicate with the subscriber units. If activity occurs on one of these operator position resources, the unit ID or associated alias of the initiating radio appears at the console resource. Default operation for the system is to display unit IDs at the console operator resource, but pre-defined aliases can be substituted for each unit ID.

Setup

Two radios are required to perform this test (Radios 1 and 2). Set both radios to Talkgroup A.

Test

Step 1. While the system is in wide area operation, verify that all radios are affiliated as described above.

Step 2. Select Talkgroup A on any operator position with that Talkgroup.

Step 3. Initiate a call from Radio 1 and observe that the portable ID or alias is seen at both consoles in the list in the resource window as well as in the Activity Log window.

Note – If the alias for the radio has been downloaded from the User Configuration Manager (UCM) to the console, the alias will be displayed in place of the unit ID.

Step 4. Repeat step 3 using Radio 2.

CONSOLE TESTS

Test 10 - Alert Tones

Description

To send alert tones from a console operator position, the dispatcher must depress one of three alert switches which sends an alert tone over a selected channel/talkgroup resource. Three distinct alert tones can be transmitted which might alert members of a talkgroup to a particular event or signify to radio users that special instructions are to follow. The three alert tones available at the console operator position are: Alert 1 - Constant 1 kHz Tone, Alert 2 - Two Alternating Tones and Alert 3 - Chopped 1 kHz Tone.

Setup

Two radios are required to perform this test (Radios 1 and 2). Set both radios to Talkgroup A.

Test

Step 1. While the system is in wide area operation, verify that all radios are affiliated as described above.

Step 2. Select Talkgroup A on any console position and depress an Alert Tone switch for 5 seconds.

Step 3. Verify that both radios hear the alert tone.

Step 4. Repeat steps 2-3 for the other alert.

CONSOLE TESTS

Test 11 - Remote Monitor

Description

Remote Monitor from Console is a call type in which the console operator can select and remotely key a subscriber unit. This allows the dispatcher to monitor the transmit audio remotely and without detection. This feature is useful in situations where the subscriber unit has been stolen, or there is a need to determine if the radio user is incapacitated and cannot activate a PTT (i.e. an officer has been injured or is under duress). The radio being monitored will not show any sign of being keyed up. Remote Monitor can only be done as an analog transmission from the radio.

Setup

Two radios are required to perform this test (Radios 1 and 2). Set both radios to Talkgroup A.

Test

Step 1. While the system is in wide area operation, verify that all radios are affiliated as described above.

Step 2. Put Radio 1 into Remote Monitor via the Remote Monitor tile on the Elite Console.

Step 3. Verify that Radio 1 keys up without any transmit indication.

Step 4. Verify any audio is heard by Radio 2 and the Console operator.

Step 5. Wait 30 seconds and verify that Radio 1 dekeys.

SITE TRUNKING TESTS

Test 1 - Site Trunking Talkgroup Call

Description

When a Site goes into Site Trunking, radios with Talkgroup call capability will be able to communicate with other members of the same Talkgroup at that same site. Members of the same Talkgroup at other sites will not be able to monitor those conversations. It will be performed in ASTRO Digital or Analog modes, as appropriate.

Setup

Four radios, each capable of performing calls on two unique talkgroups, are required to perform this test (Radios 1, 2, 3, 4). Set Radios 1 and 2 to Talkgroup A, and Radios 3, and 4 to Talkgroup B.

Test

Step 1. Verify that the radios are setup as described above.

Step 2. Place Site 1 into the Site Trunking mode via the Manager.

Step 3. Initiate a Talkgroup Call with Radio 1 in Talkgroup A.

Step 4. Observe that only Radio 2 will be able to monitor and respond to the call.

Step 5. Initiate a Talkgroup Call with Radio 3 in Talkgroup B.

Step 6. Observe that only Radio 4 will be able to monitor and respond to the call.

SITE TRUNKING TESTS

Test 2 - Site Trunking Private Call

Description

Private Calls is a selective calling feature that allows a dispatcher or radio user to carry on one-to-one conversation that is only heard by the 2 parties involved. When a site is in Site Trunking, Radios at the site will only be able to Private Call other radios at the same site.

Setup

Two radios are required to perform this test (Radios 1, and 2). Talkgroup settings are not critical for this test.

Test

Step 1. Verify the system is in the Site Trunking mode.

Step 2. Using Radio 1, press the Private Call button.

Step 3. Enter the Unit ID of Radio 2 with the keypad, or scroll to the location where this ID is stored.

Step 4. Press the PTT to initiate the call.

Step 5. Verify that at Radio 2 only tones are heard and the display indicates that a call has been received.

Step 6. Answer the call at Radio 2 by pressing the Private Call button. Verify its display shows the ID number of the calling unit.

Step 7. Press the PTT switch on Radio 2 and respond to the call.

Note - If you do not press the Private Call button before pressing PTT, your audio will be heard by all members of the talkgroup, and not by the radio initiating the Private Call.

Step 8. Verify only Radio 1 hears the audio from Radio 2.

Step 9. End the Private Call and return to normal talkgroup operation.

SITE TRUNKING TESTS

Test 3 - Site Trunking Call Alert

Description

Call Alert is a tone page that allows a user to selectively alert another radio unit. When a site is in Site Trunking, Radios at the site will only be able to Call Alert other radios at the same site. The initiating radio will receive notification from the trunked system as to whether or not the page was received by the target radio.

Setup

Two radios are required to perform this test (Radios 1, and 2). Talkgroup settings are not critical for this test.

Test

Step 1. Verify the system is in the Site Trunking mode.

Step 2. Place the site to which the radios are affiliated into the Site Trunking mode via the Manager.

Step 3. Using Radio 1, press the Alert button.

Step 4. Enter the Unit ID of Radio 2 with the keypad, or scroll to the location where this ID is stored.

Step 5. Press the PTT to initiate the Call Alert.

Step 6. Verify that Radio 2 received the Call Alert.

Step 7. Exit the Call Alert mode and return to normal talkgroup mode.

SITE TRUNKING TESTS

Test 4 - Site Trunking Busy Queuing and Callback

Description

If no voice channel resources are available, radios requesting channels for new conversations are placed in a queue. Users of the same priority will move through the queue in a FIFO (first in, first out) sequence; however, users of higher priority will be inserted ahead of lower priority users in the queue.

When a voice channel becomes available, the radio at the top of the busy queue gets a channel assignment and generates a callback tone. The callback alerts the user that a channel assignment was made and transmitting is now possible on the selected talkgroup.

Setup

Four radios, each capable of performing calls on two unique talkgroups, are required to perform this test (Radios 1, 2, 3, 4). Set Radios 1 and 4 to Talkgroup A, and Radios 2, and 3 to Talkgroup B.

Test

Step 1. Verify that the radios are setup as described above and the system is in the Site Trunking mode.

Step 2. Disable all channels except the control channel and one voice channel at the site to which the radios are affiliated.

Step 3. Initiate a Talkgroup Call with Radio 1 and observe that it is received by Radio 4. Keep this call in progress until instructed to end the call.

Step 4. Key Radio 2 and observe that the radio receives a busy.

Step 5. Key Radio 3 and observe that the radio receives a busy.

Step 6. End the Talkgroup Call established in step 4.

Step 7. Observe that Radio 2 receives a callback prior to Radio 3 receiving a callback.

Step 8. Return all channels for the site to service.

SITE TRUNKING TESTS

Test 5 - Site Trunking Emergency Call and Alarm

Description

Users in life threatening situations can use the Emergency button on the radio to be assigned the next available voice channel. The first available channel is assigned and held by the emergency talkgroup. This is demonstrated for a site in Site Trunking.

Setup

Four radios, each capable of performing calls on three unique talkgroups, are required to perform this test (Radios 1, 2, 3, 4). Set Radios 1 and 2 to Talkgroup A, Radio 3 to Talkgroup B, and Radio 4 to Talkgroup C. Set Emergency parameter for "Top of Queue" operation in the Manager.

Test

Step 1. Verify that all four radios are affiliated to the system and have the talkgroups selected as indicated above.

Step 2. Verify the system is in the Site Trunking mode.

Step 3. Busy all channels at the site to which the radio is affiliated with the exception of the control channel and one voice channel (will be the same channel for IR sites with Voice on Control).

Step 4. Press the PTT on Radio 3 and hold the PTT switch until instructed to release.

Step 5. Press the PTT on Radio 4. Verify that it gets a busy bonk and then release the PTT switch.

Step 6. Using Radio 1 send an emergency call by depressing the emergency switch and then the PTT switch.

Step 7. Observe that Radio 1 cannot transmit due to the voice channel being busy.

Step 8. Release the PTT switch on Radio 3.

Step 9. Observe that Radio 1 can now proceed with the call and Radio 2 receives the call.

Step 10. Also observe that the display on Radio 2 denotes an emergency and the ID of the unit sending the emergency.

Step 11. End the emergency call.

Step 12. Verify that Radio 4 gets a callback.

Step 13. Restore all channels to service.

SITE TRUNKING TESTS

Test 6 - Site Trunking Continuous Assignment Updating

Description

When a talkgroup is assigned a voice channel, the channel assignment information is transmitted over the control channel for the duration of the talkgroup call. Radios coming into use on the system are automatically sent to voice channels with conversations in progress involving their selected talkgroups. This is demonstrated for a site in Site Trunking.

Setup

Three radios are required to perform this test (Radios 1, 2 and 3). Initially verify that all radios have the Talkgroup A selected.

Test

Step 1. Verify that the radios are setup as described above.

Step 2. Turn OFF Radio 1 in the Talkgroup A.

Step 3. Using Radio 2 initiate a Talkgroup Call on Talkgroup A.

Step 4. Verify Radio 3 listens to the call on Talkgroup A.

Step 5. While the call on Talkgroup A is in progress, turn on Radio 1.

Step 6. Observe that Radio 1, which was just brought back into service, joins the call on Talkgroup A , already in progress.

SYSTEM MANAGEMENT TESTS

Test 1 - FullVision Fault Management

Description

FullVision is able to capture information about various failures at the system and zone level. Colors are used to distinguish various levels of fault importance to the system.

Test 1A - Site Path Failure

Setup

No setup required.

Test

Step 1. Remove a T1 cable associated with the site in the system to which Radio 1 is affiliated.

Step 2. Observe the appropriate traps appear on FullVision.

Step 3. Observe the color for the site object turns from Green (normal) to Orange (major) on FullVision.

Step 4. In addition, observe that the site is now in the Site Trunking mode.

Step 5. Restore the cable removed in step 1.

Step 6. Observe the site returns to the Wide Area Trunking mode.

Step 7. Observe the color for the site object turns back to Green (normal) on FullVision.

Test 1B - Ambassador Link Failure

Setup

No setup is required for this test. Note: If the link involves redundancy, the redundant link remains active while the main link is disconnected during the test.

Test

Step 1. Remove one of the IntraZone Ambassador boards from any Zone Controller.

Step 2. Observe the appropriate alert indicating an Audio Switch slot failure appears on FullVision.

Step 3. Observe the color for the associated Mux and AMB objects turns from Green (normal) to Red (Major) on FullVision.

Step 4. Replace the board removed in step 1.

Step 5. Observe an alert appears at the Manager and on FullVision indicating the module is restored to service.

Step 6. Observe the color for the associated Mux and AMB objects turns back to Green (normal) on FullVision.

SYSTEM MANAGEMENT TESTS

Test 2 - Fault Management: Diagnostics

Description

Through the Zone Configuration Manager, the system user can run diagnostics that change the trunking state of a site. The effects of the diagnostic are displayed on FullVision.

Setup

Click on the Quick Status Symbol for the Zone with the site to be tested. Click on the appropriate Site Icon to bring up the Alarm browser.

Test

Step 1. Through the Zone Configuration Manager, chose the City of Miami Beach "site".

Step 2. Choose a "site" to be placed into Site Trunking by left clicking the mouse on the site name.

Step 3. Put the "site" into Site Trunking by right clicking the mouse, selecting diagnostics and selecting "Site Trunking".

Step 4. Observe that the FullVision Alarm Browser shows that the site is now in Site Trunking and is User Requested.

Step 5. Place the "site" back into Wide Area Trunking by right clicking the mouse, selecting diagnostics and selecting "Wide Trunking".

Step 6. Observe that the FullVision Alarm Browser now shows Wide Area Trunking.

Step 7. Close the open windows.

SYSTEM MANAGEMENT TESTS

Test 3 - Zone Watch

Description

ZoneWatch is an administration tool for monitoring radio traffic on a system. A system manager can use ZoneWatch to analyze traffic patterns for load distribution and troubleshoot radio and site problems. ZoneWatch is used to view current radio traffic activity for the system. This activity is displayed in graphical format, color-coded for easy identification of the type of activity occurring on the system.

Setup

Any number of radios affiliated to sites within a zone may be used for this test. The identical talkgroup will be selected on all radios. Set up the Zone Watch Window Definitions and Watch Profile though the User Configuration Manager to allow Multi-Site Scroll and Grid Display.

Test

Step 1. From the PC Application Launcher, select a zone folder.

Step 2. From within that zone, select Zone Watch.

Step 3. Select the profile created in the Setup procedure.

Step 4. Initiate several calls with the radios and observe that the appropriate channel usage information is displayed.

SYSTEM MANAGEMENT TESTS

Test 4 - Configuration Management – Subscriber Radio User

Description

The User Configuration Manager controls the parameters for all radio users and dispatchers on the system. Within the Subscriber section, the Radio User Configuration Window enables the network manager to tailor the subscribers' capabilities. Multigroup, Busy Override, Secure, Call Alert, Private Call, and Telephone Interconnect are some of the features that can be enabled or disabled. The features that could be unique to the particular user are configured directly in the Radio User Configuration Window. The features that could be configured the same for a group of users are placed into records called a profiles. The network manager references the profile which contains the desired setup for these features from the Radio User Configuration Window.

Note – The Radio Configuration Window must be completed before the Radio User Configuration Window because the serial number and unit ID information for each subscriber resides in the Radio Configuration Window. A profile must already exist to be referenced but can be modified later if needed.

Setup

Two radios are required to perform this test (Radios 1 and 2) affiliated anywhere in the system. Select Talkgroup A on both Radios. Flag both radios to be capable of Call Alert, Private Call, and Dispatch Calls. Set the "User Enabled" flag to YES for both Radios 1 and 2.

Test

Step 1. Initiate a TG A call from Radio 1. Verify that Radio 2 hears the Radio 1 audio.

Step 2. Change the User Enabled flag to NO for Radio 1 via the Zone Configuration Manager (ZCM).

Step 3. Initiate a TG A call from Radio 1. Verify that Radio 1 receives a reject upon initiating a TG A call because of the change in status of the User Enabled Flag.

Step 4. Verify that Radio 2 can still initiate a TG A call.

Step 5. Initiate a Private Call from Radio 2 to Radio 1. Verify that Radio 2 receives a reject when attempting to Private Call radio 1.

Step 6. Verify that radio 1 receives a reject upon attempting to Private Call radio 2.

Step 7. Initiate a Call Alert from Radio 2 to Radio 1. Verify that Radio 2 receives a reject when attempting to Call Alert Radio 1.

Step 8. Verify that Radio 1 receives a reject upon attempting to Call Alert Radio 2.

Step 9. Change the User Enabled flag back to YES for Radio 1 via the ZCM.

Step 10. Initiate a TG A call from Radio 1. Verify that Radio 1 can now initiate a TG A call.

Step 11. Initiate a Call Alert from Radio 1 to Radio 2. Verify that Radio 2 receives the Call Alert.

Step 12. Change the Call Alert Enabled flag to NO for Radio 1 via the ZCM.

Step 13. Initiate a Call Alert from Radio 2 to Radio 1. Verify that radio 2 receives a reject when attempting to Call Alert Radio 1.

Step 14. Change the Call Alert Enabled flag back to YES for Radio 1 via the ZCM.

Step 15. Initiate a Call Alert from Radio 2 to Radio 1. Verify that Radio 1 now receives the Call Alert.

Step 16. Initiate a Private Call from Radio 1 to Radio 2. Verify that Radio 2 receives the Private Call.

Step 17. Change the Private Call Enabled flag to NO for Radio 1 via the ZCM.

Step 18. Initiate a Private Call from Radio 2 to Radio 1. Verify that Radio 2 receives a reject when attempting to Private Call Radio 1.

Step 19. Change the Private Call Enabled flag back to YES for Radio 1 via the ZCM.

Step 20. Initiate a Private Call from Radio 2 to radio 1. Verify that Radio 1 now receives the Private Call.

SYSTEM MANAGEMENT TESTS

Test 5 - Configuration Management – Subscriber Talkgroup

Description

The User Configuration Manager controls the parameters for all radio users and dispatchers on the system. Within the Subscriber section, the Talkgroup Configuration Window enables the network manager to tailor Talkgroup capabilities. Emergency, Busy Override, Secure and Priority Monitor are some of the features that can be enabled or disabled. The features that could be unique to the particular Talkgroup are configured directly in the Talkgroup Configuration Window. The features that could be configured the same for a group of Talkgroups are placed into records called a profiles. The network manager references the profile which contains the desired setup for these features from the Talkgroup Configuration Window.

Note - A profile must already exist to be referenced through the Talkgroup Configuration Window but can be modified later if needed.

Setup

Three radios are required to perform this test (Radios 1,2 and 3). Select Talkgroup A on all Radios. Set the "Group Enabled" flag to Yes. Set the "Audio Interrupt Mode" flag to No.

Test

Step 1. Initiate a TG A call from Radio 1. Verify that Radio 2 hears the Radio 1 audio.

Step 2. Change the Group Enabled flag to NO for TG A via the UCM.

Step 3. Initiate a TG A call from Radio 1 or Radio 2. Verify that neither radio can initiate a TG A call because of the change in status of the Group Enabled Flag.

Step 4. Change the Group Enabled flag back to YES for TG A via the UCM.

Step 5. Initiate a TG A call from Radio 1. Verify that Radios 2 and 3 hear the Radio 1 audio.

Step 6. Key Radio 2 and verify it is not allowed to transmit. Radio 3 continues to listen to Radio 1.

Step 7. Change the "Audio Interrupt" flag to yes.

Step 8. Initiate a TG A call from Radio 1. Verify that Radios 2 and 3 hear the Radio 1 audio.

Step 9. Key Radio 2 and verify it is now allowed to transmit and Radio 3 now listens to Radio 2.

REPORT GENERATION TESTS

Test 1 - SpectrumView Reports

Description

SpectrumView allows performance reports to be created automatically for dynamic statistical information about the air traffic activity on the system. These reports provide assistance with system management, resource planning, usage allocation, and monitoring. All reports are preformatted and summarize air traffic activity for a configured time span.

Setup

No prior setup is required for this test.

Test

Step 1. From the PC Application Launcher, select a zone.

Step 2. From that zone's menu, choose Zone Historical Reports.

Step 3. From the Historical Reports Player window that opens, select a report.

Step 4. Using the left mouse button, click on the view button.

Step 5. Observe a window opens allowing a user enter report parameters.

Step 6. Enter all desired data for the report and Generate Report.

Step 7. Observe a window appears showing the requested report.

Step 8. Close the report window.

Run the following reports during testing.

- Talkgroup at Zone Summary
- Radio User at Zone Summary
- Site Summary

REPORT GENERATION TESTS

Test 2 - Zone Configuration Manager Reports: Infrastructure

Description

The Zone Configuration Manager report window allows the user to generate data summaries to view information from the database in a Web browser or to export the information as a file. The Zone Configuration Manager report window shows the users all of the fields that can be included in the report. By selecting which fields are wanted in the report and entering selection criteria for each field, the user can restrict the data that is retrieved.

Setup

No prior setup is required for this test.

Test

Step 1. From the PC Application Launcher, select a zone.

Step 2. From that zone's menu, select Zone Configuration Manager.

Step 3. Navigate through the folders on the left side to the object for which a report is to be generated.

Step 4. Under the toolbar FILE pulldown menu, select Reports.

Step 5. Observe a window opens allowing a user to create a report.

Step 6. Enter sorting data for the report and click Generate Report.

Step 7. Observe a window appears showing the requested report.

Step 8. Close the report window.

Run the following reports during testing:

- AMB Link (Switch/AMB)
- Slot (Switch/MUX)
- IZ Channel (Switch/MUX)

REPORT GENERATION TESTS

Test 3 - User Configuration Manager (UCM) Reports

Description

The User Configuration Manager report window allows the user to generate data summaries to view information from the database in a Web browser or to export the information as a file. The User Configuration Manager report window shows the users all of the fields that can be included in the report. By selecting which fields are wanted in the report and entering selection criteria for each field, the user can restrict the data that is retrieved.

Setup

No prior setup is required for this test.

Test

Step 1. From the PC Application Launcher, select User Configuration Manager.

Step 2. Click on the appropriate folder to list its contents if it is not already open.

Step 3. Select the object for which a report is to be generated.

Step 4. Under the toolbar FILE pulldown menu, select Reports.

Step 5. Observe a window opens allowing a user to create a report.

Step 6. Enter all sorting data for the report and click Generate Report.

Step 7. Observe a window appears showing the requested report.

Step 8. Close the report window.

Reports available to an operator under the UCM User Configuration Reports section are arranged in three categories: Subscribers, Security and System Configuration. Run the following reports during testing:

- Under Subscribers folder– select Radio User
- Under Security – select User
- Under System Configuration - select System

RADIO CONTROL MANAGER (RCM) TESTS

Test 1 - Emergency Alarm Display

Description

The emergency call information that is displayed on the SZ RCM includes the radio alias of the radio that initiated the Emergency Alarm, the talkgroup that the radio was affiliated to at the time the alarm was sent, and the time the alarm was received.

Setup

Two radios are required to perform this test (Radios 1 and 2). Set Radios to Talkgroup A. One RCM is required which has Talkgroup A attached to it.

Test

Step 1. Open the RCM windows and verify that the Emergency Alarm window is visible. If it is not, go the View menu and select it bringing it into the RCM viewable area.

Step 2. Initiate an Emergency Alarm from Radio 1.

Step 3. Observe that the RCM receives the Emergency Alarm.

Step 4. Acknowledge the Emergency by selecting the Emergency in the window and clicking on the Respond button.

Step 5. Again select the displayed Emergency and click the Delete button to clear the emergency.

Step 6. Reset the radio by holding the Emergency button until the radio clears.

Step 7. Repeat steps 1-6 using Radio 2.

RADIO CONTROL MANAGER (RCM) TESTS

Test 2 - Dynamic Regrouping

Description

Dynamic Regrouping allows the RCM to assign individual radios operating in different talkgroups to a temporary talkgroup via the REGROUP command. Network managers or supervisors can override individual radio talkgroup selections by steering regrouped subscribers to a new talkgroup containing users which need to communicate on a temporary basis. After receiving a REGROUP command, a radio will ignore the current setting of the talkgroup selector and move to the target talkgroup specified in the Regroup command. Unless the supervisor issues a LOCK command, the radio user can deselect the target talkgroup by selecting another talkgroup using the radio selector. A unique location on the radio selector is reserved for the target talkgroup following a REGROUP command.

Dynamic Regrouping assignments can be initiated rapidly, but not instantaneously. Regrouping is best suited for planned activities or occasional changes from normal routines. It is not intended for immediate emergency responses such as highspeed chases or for rapid deployments on a per incident basis.

Regrouped radios receiving a second Regroup command will move to the new target talkgroup specified in the second command. When a regrouped radio receives a REGROUP command, all information pertaining to the previous REGROUP command is lost. An XREGROUP command returns an individual radio to its normal operation.

Note - RCM user must be attached to primary and target talkgroups.

Setup

Six radios, are required to perform this test (Radios 1, 2, 3, 4, 5 and 6). Set Radios 1, 2 and 3 to Talkgroup A and set Radios 4, 5 and 6 to Talkgroup B.

Test

Step 1. With the RCM open from the View menu item select the Commands item to open the command window.

Step 2. Enter the talkgroup ID or alias to which the radios are to be regrouped in the target field.

Step 3. Enter the IDs or aliases of the test radios to be regrouped.

Step 4. Once all desired radio information is entered and appears in the command window click the Regroup button to initiate the command.

Step 5. Observe all radios are regrouped and are able to communicate on the common talkgroup.

Step 6. Switch the Subscriber to the Dynamic Regroup channel to ack the group request.

Step 7. Observe that the radios are able to select different talkgroups and are not locked onto the regrouped mode.

Step 8. Observe that the Regroup task appears in the Command Monitor window.

Step 9. Issue a Selector Lock command to the radios.

Step 10. Observe that the Selector Lock task appears in the Command Monitor window.

Step 11. Observe that the radios are now not able to select different talkgroups and are locked onto the regrouped mode.

Step 12. Unlock the radios by selecting the task in the Command Monitor window and clicking on the Revert button to submit the task.

Step 13. Verify that the selector switches have been unlocked by changing modes on the subscribers.

Step 14. Un-regroup the radios by selecting the task in the Command Monitor window and clicking on the Revert button to submit the task.

Step 15. Observe that the regrouping of the radios is now dissolved.

RADIO CONTROL MANAGER (RCM) TESTS

Test 3 - Storm Plans

Description

Storm Plans represent any number of preprogrammed Dynamic Regrouping combinations constructed in advance to anticipate a unique need, such as a disaster, or to make a needed adjustment for an infrequent yet repeated event, like a parade or election. When implemented, a Storm Plan will automatically assign individual radios operating in different talkgroups to a temporary talkgroups, containing the radios specified by the stored Dynamic Regrouping command. Storm Plans are deactivated with the XSTORM command.

Setup

Four radios, each capable of performing calls on two unique talkgroups, are required to perform this test (Radios 1, 2, 3, and 4). This test requires no specific site affiliation. Set Radios 1 and 2 to Talkgroup A, and Radios 3 and 4 to Talkgroup B. The Storm Plan will regroup Radios 1 and 2 to Talkgroup B.

Test

Step 1. With the RCM open from the View menu item select the Storm Plan item to open the command window.

Step 2. Select the Storm Plan.

Step 3. Click on OK or Apply to invoke the Storm Plan.

Step 4. Observe that the Storm Plan appears in the Command Monitor window.

Step 5. Observe all radios are regrouped.

Step 6. Initiate a call from radio.

Step 7. Observe that Radios 3 and 4 are able to communicate with one another.

Step 8. Un-regroup the radios by selecting the task in the Command Monitor window and clicking on the Revert button to submit the task.

Step 9. Observe that the regrouping of the radios is now dissolved.

RADIO CONTROL MANAGER (RCM) TESTS

Test 4 - Selective Radio Inhibit

Description

The INHIBIT command issued by the RCM disables a radio, preventing it from transmitting or receiving any audio. All of the radio's functionality ceases while a radio is inhibited by the SZ RCM. Once inhibited, the radio cannot be used to monitor voice channels or for any other radio user initiated activity. Note that an inhibited radio still monitors the control channel so that it can be re-enabled with the XINHIBIT command. Upon receiving the XINHIBIT command from the SZ RCM, the radio returns to its normal operation.

Setup

No setup is needed.

Test

Step 1. Select the View menu and then select the Commands item in the menu.

Step 2. Observe a Command window is opened.

Step 3. Enter the IDs or aliases of the test radio.

Step 4. Once all desired radio information is entered and appears in the command window click the Inhibit button to initiate the command.

Step 5. Observe the radio is inhibited and appears to be dead.

Step 6. Observe that the Inhibit task appears in the Command Monitor window.

Step 7. Un-inhibit the radio and observe that the radio is restored to normal operation.

RADIO CONTROL MANAGER (RCM) TESTS

Test 5 - Radio Check

Description

Radio Check is a RCM command used to verify that a radio is active in the trunking system. The Radio Check command causes the Zone Controller to poll for the radio requesting that the radio re-affiliate. When the radio re-affiliates, the RCM then has the knowledge that the radio is powered on and within system range. If the radio is involved in a conversation, whether group or interconnect, the RCM application displays a message to that effect.

The information displayed by the RCM in response to the Radio Check command is: current talkgroup affiliation, the multigroup that the talkgroup is attached to (assuming the talkgroup belongs to a multigroup), and the site where the radio is affiliated. If the radio does not respond to the Radio Check command, a message to that effect displays.

Setup

Two radios are required to perform this test (Radios 1 and 2). Initially verify that both radios have identical talkgroups selected.

Test

Step 1. With both radios turned on verify that the radios are setup as described above.

Step 2. Open the Radio Check item from the RCM.

Step 3. Observe a Radio Check window is opened.

Step 4. Enter the IDs or aliases of either of the test radios into the entry box and click the Apply button.

Step 5. Observe the radio is polled and the current radio information is displayed on the RCM.

Step 6. Turn off Radio 1.

Step 7. Enter the ID or alias of the Radio 1 into the entry box and click the Apply button.

Step 8. Observe that the RCM displays "Radio Time Out."

Step 9. Depress and hold the PTT button of Radio 2 until instructed to release.

Step 10. Enter the ID or alias of Radio 2 into the entry box and click the Apply button.

Step 11. Observe that a busy for the radio is displayed on the RCM.

Step 12. Release the PTT button on Radio 2.

Step 13. Observe the radio is polled and the current radio information is displayed on the RCM.

RADIO CONTROL MANAGER (RCM) TESTS

Test 6 - Snapshot

Description

Snapshot is a RCM command used to retrieve information about an individual radio. Information provided by the RCM application in response to the Snapshot command includes: the serial number of the radio, current talkgroup/multigroup and site affiliations; the Regroup, Inhibit, and Selector Lock state of the radio. Snapshot information is taken from the system databases. The Snapshot command does not initiate any communication with the target radio.

Setup

Three radios are required to perform this test (Radios 1,2 and 3). Set Radios 1 and 2 to Talkgroup A and Radio 3 to Talkgroup B. Radios 1 and 3 must be programmed with Dynamic Regrouping capability. Configure the RCM to monitor Talkgroups A, B, and C.

Test

Step 1. From the RCM, dynamically regroup Radios 1 and 3 to Talkgroup C

Step 2. At the RCM, initiate the Snapshot command for Radio 1.

Step 3. Verify that the dispatcher terminal shows Radio 1 affiliated to Site 1 and that Radio 1's current state is "Regrouped."

Step 4. At the RCM, terminate the dynamic regrouping on Radios 1 and 3.

Step 5. Initiate the Snapshot command for Radio 1.

Step 6. Verify Radio 1 shows an affiliation to Site 1 and that its current state is "Xregrouped" (not regrouped).

Step 7. At the RCM, inhibit Radio 2 and then initiate the Snapshot command for Radio 2.

Step 8. Verify Radio 2 shows an affiliation to Site 1 and that its current state is "Inhibited."

Step 9. At the RCM, un-inhibit Radio 2 and then initiate the Snapshot command for Radio 2.

Step 10. Verify Radio 2 shows an affiliation to Site 1 and that its current state is "Xinhibited" (not inhibited).

RADIO CONTROL MANAGER (RCM) TESTS

Test 7 - Status/Message

Description

This optional feature allows the Radio Console Manager to view status/message information sent in by subscribers. Messages are used to ask the RCM user to do something or to give the RCM user some information. Statuses are used to indicate the Radio operator's operational state (e.g. off duty). The information that will be displayed includes the radio alias, talkgroup alias, hour and minute time stamp, status number or message number, and the customer entered translation for the specific status or message. Status/message input is displayed in chronological order, independent of the type of status or message number.

Setup

One radio is required to perform this test (Radios 1). Radio 1 can be affiliated to any site in the system. Set Radios 1 to Talkgroup A. Configure the radio user in the manager to use a particular status and message set. Configure the assigned status and message set (via the status set and message set manager config objects) to include text translations for a few different statuses and messages. The RCM user needs to be assigned the dispatch attachment group that matches the radio user's assigned dispatch attachment group.

Test

Step 1. Initiate a Status transmission from the Radio.

Step 2. Verify the RCM displays the proper Status text.

Step 3. Initiate a Message transmission from the Radio.

Step 4. Verify the RCM displays the proper Message text.

SYSTEM RELIABILITY/FEATURES TESTS

Test 1 - AEB to CEB Redundant Link Failure

Description

Communication between the AEB and each CEB take place over dedicated links. The two links between the AEB and a CEB operate in a hot/standby mode. The system will continue uninterrupted if the main link fails.

Setup

Two radios are required to perform this test (Radios 1 and 2). Set Radios 1 and 2 to the Talkgroup A. Select a CEB with redundant links to the AEB. The CEB must have at least one console operator position capable of monitoring the selected Talkgroup A.

Test

Step 1. Verify that the radios are setup as described above.

Step 2. Initiate a Talkgroup call with Radio 1 in Talkgroup A.

Step 3. Observe that Radio 2 and the selected console op position are able to monitor and respond to the call.

Step 4. Pull either of the AIMI links between the AEB and the CEB.

Step 5. Initiate a Talkgroup Call with Radio 1 in Talkgroup A.

Step 6. Observe that Radio 2 and the selected console op position are able to monitor and respond to the call.

Step 7. Enable the link previously disabled in step 4.

Repeat the above steps for the other AEB to CEB link.

SYSTEM RELIABILITY/FEATURES TESTS

Test 2 - AEB to Zone Controller Redundant Link Failure

Description

Communication between the AEB and the Zone Controller take place over dedicated links. The two links between the Zone Controller and audio switch operate in a hot standby mode. The system will continue uninterrupted if the main link fails.

Setup

Four radios, each capable of performing calls on two unique talkgroups, are required to perform this test (Radios 1, 2, 3, and 4). Set Radios 1 and 2 to Talkgroup A and Radios 3 and 4 to Talkgroup B.

Test

Step 1. Verify that the radios are setup as described above.

Step 2. Initiate a Talkgroup Call with Radio 1 in Talkgroup A.

Step 3. Observe that only Radio 2 will be able to monitor and respond to the call.

Step 4. Initiate a Talkgroup call with Radio 3 in Talkgroup B.

Step 5. Observe that only Radio 4 will be able to monitor and respond to the call.

Step 6. Pull either of the links between the audio switch and Zone Controller.

Step 7. Initiate a Talkgroup Call with Radio 1 in Talkgroup A.

Step 8. Observe that only Radio 2 will again be able to monitor and respond to the call.

Step 9. Initiate a Talkgroup Call with Radio 3 in Talkgroup B.

Step 10. Observe that only Radio 4 will again be able to monitor and respond to the call.

Step 11. Enable the link previously disabled in step 6.

Repeat the above steps for the other Zone Controller to AEB link.

SYSTEM RELIABILITY/FEATURES TESTS

Test 3 - Multiple Control Channels

Description

A maximum of four channels are eligible for assignment as control channel in each site. In the event that the assigned control channel fails at any remote site, the Zone controller automatically selects one of the other control capable channels as the active control channel for that site. A Control Channel Preference Level can be used to rank the control capable channels where 1 is the highest ranking and 4 is the lowest.

Setup

Four radios, each capable of performing calls on two unique Talkgroups, are required to perform this test (Radios 1, 2, 3, and 4).. Set Radios 1 and 2 to Talkgroup A, and Radios 3 and 4 to Talkgroup B.

Test

Step 1. Verify that the radios are setup as described above.

Step 2. Initiate a Talkgroup Call with Radio 1 in Talkgroup A.

Step 3. Observe that only Radio 2 will be able to monitor and respond to the call.

Step 4. Initiate a Talkgroup Call with Radio 3 in Talkgroup B.

Step 5. Observe that only Radio 4 will be able to monitor and respond to the call.

Step 6. Disable the control channel at the site to which Radios 1 and 3 are affiliated.

Step 7. Observe that the control channel rotates to the next available channel capable of acting as a control channel.

Step 8. Initiate a Talkgroup Call with Radio 1 in Talkgroup A.

Step 9. Observe that only Radio 2 will be able to monitor and respond to the call.

Step 10. Initiate a Talkgroup Call with Radio 3 in Talkgroup B.

Step 11. Observe that only Radio 4 will be able to monitor and respond to the call.

Step 12. Enable the channel previously disabled in step 6.

SYSTEM RELIABILITY/FEATURES TESTS

Test 4 - Subsystem Failsoft

Description

Failure of all control channels, failure of all voice channels, or failure of the subsystem or site controller will cause a Zone subsystem to enter failsoft operations. Subscribers can be programmed to operate in failsoft by talkgroup; to search its list of control channel frequencies in failsoft; or to disable failsoft altogether. When a system enters failsoft, a radio programmed for failsoft by talkgroup will first look for a specific failsoft channel dictated by the selected talkgroup. Since many systems have different frequencies across sites, if the radio is unable to find the talkgroup's failsoft channel the radio will instead operate in the control channel search failsoft mode. A radio programmed or needing to search control channels for failsoft frequencies will lock onto the lowest frequency control channel at the site.

Setup

Two radios are required to perform this test (Radios 1 and 2). Ensure they are affiliated to the same site on Talkgroup A. Program Radios for failsoft operation by talkgroup.

Test

Step 1. Using the Zone Configuration Manager, put the system into failsoft mode.

Step 2. Verify that the radios operate according to their failsoft programming scheme (failsoft by talkgroup in this test, failsoft by personality or failsoft disabled are other options).

Step 3. Initiate a talkgroup call from Radio 1 while in failsoft mode.

Step 4. Verify that Radio 1 emits a failsoft tone approximately once every ten seconds.

Step 5. Verify that Radio 1 operates on the correct failsoft channel for its selected Talkgroup A and Radio 2 hears its audio.

Step 6. Disable the failsoft channel associated with Talkgroup A.

Step 7. Verify that both Radios search their control channel list for a suitable failsoft channel since the original Talkgroup A channel has been disabled.

SYSTEM RELIABILITY/FEATURES TESTS

Test 5 - Base Station Identification

Description

In order to meet FCC requirements, Motorola trunked systems are programmed to broadcast the system ID in Morse code every 30 minutes. The Base Station Identification (BSI) will be transmitted by the channels specified through the Zone Configuration Manager.

Setup

A service monitor will be required to perform this test.

Test

Step 1. Choose one site to test for Base Station Identification.

Step 2. Setup the service monitor to receive the transmit frequency of the BSI channel for the particular site.

Step 3. Monitor the service monitor until the system ID is broadcast.

SYSTEM RELIABILITY/FEATURES TESTS

Test 6 - Zone Controller Switching

Description

The Zone Controller subsystem uses two Zone Controllers in a redundant configuration. The backup Zone Controller is made active either upon the loss of the active ZC or upon a user-initiated command from the Zone Configuration Manager.

Setup

Three radios are required to perform this test (radios 1, 2 and 3). All Radios should be selected to Talkgroup A.

Test

User Initiated Switchover

Step 1. While the system is in wide area operation, verify all radios are on the same talkgroup.

Step 2. Verify in the Zone Configuration Manager (ZCM) that the switchover mode is user-initiated.

Step 3. Switch the Zone Controllers from the ZCM.

Step 4. Verify that the backup Zone Controller becomes active and brings all sites back wide within 2 minutes.

Step 5. Key Radio 1 and verifying that the other 2 radios hear the audio.

Step 6. End the call from Radio 1.

Automatic Switchover

Step 7. Set the switchover mode to automatic through the ZCM.

Step 8. Pull the loopback cable on the Sync Card on the active Zone Controller.

Step 9. Verify that the backup Zone Controller becomes active and brings all sites back wide within 2 minutes.

Step 10. Key Radio 1 and verifying that the other 2 radios hear the audio.

Step 11. End the call from Radio 1.

SYSTEM RELIABILITY/FEATURES TESTS

Test 7 - Central Controller Switching

Description

To ensure continued communication, sub-systems with a redundant central controller will automatically switch to a Alternate Central Controller in the event of a major alarm on the Main Central Controller. The switch will occur so that Wide Area Trunking communications are maintained with respect to the subscribers. Some conditions which will initiate a central controller switch include: no voice channels available for assignment, no control channels available for assignment, and active central controller hardware failure.

Setup

Two radios are required to perform this test (Radios 1 and 2). Set both radios to Talkgroup A.

Test

Step 1. While the system is in wide area operation, verify all radios are on the same talkgroup.

Step 2. Disable all control capable channels on the Main Controller to create a major alarm.

Step 3. Verify that the Main Central Controller switches to the Alternate Controller because of the major alarm.

Step 4. Verify a transmission from Radio 1 is heard by Radio 2. Wide Area Trunking is maintained with respect to the subscribers despite the major alarm on the Main Controller.

Step 5. Reset the control capable channels on the Main Controller.

SYSTEM RELIABILITY/FEATURES TESTS

Test 8 - Receiver Interference Shutdown

Description

Receiver interference occurs when an unauthorized signal is received by a repeater. In order to prevent a disruption of communications, the affected channel will be removed from the system's pool of available channel resources when the undesired carrier is detected for longer than the specified time-out period. Once the interfering carrier disappears, the channel is returned to service within approximately 5 minutes. The channel is then enabled.

Setup

Set the Carrier Malfunction Timer through the Zone Configuration Manager to 5 seconds.

Test

Step 1. Using a service monitor, transmit a 1 kHz tone at the receive frequency of any repeater station.

Step 2. Verify the channel is removed from the selection/assignment process.

Step 3. Continue to transmit the 1 kHz tone until the controller removes the channel from service (timer is configurable at the Site level through the Carrier Malfunction Time parameter).

Step 4. From FullVision, verify channel malfunction due to interfering carrier is indicated.

Step 5. Remove the interfering signal. Verify the Channel is returned to service within five minutes and that FullVision indicates that the channel is now enabled.

Step 6. Return the Carrier Malfunction Timer to the desired system value.

SYSTEM RELIABILITY/FEATURES TESTS

Test 9 - MOSCAD Unattended Shutdown (Optional)

DESCRIPTION

The Zone Controller Subsystem has an option to provide a local UPS for the Zone Controllers to prevent operating system or hardware failures down during a power failure. A MOSCAD unit is used to shutdown the Zone Controller(s) during long power failures if the UPS battery is running low.

Setup

None required. Default shutdown time is 5 minutes. This test assumes the default time has not changed.

Test

Step 1. Unplug the power cable to the local UPS.

Step 2. Wait approximately 5 minutes and verify that the Zone Controller(s) is (are) properly shutdown.

Step 3. Plug the power cable back into the local UPS and startup the Zone Controller(s).

SYSTEM RELIABILITY/FEATURES TESTS

TEST 10 INDIVIDUAL REPEATER FAILSOFT

DESCRIPTION

Individual repeater Failsoft allows the 10 available repeaters at a site to be manually placed in the Failsoft mode via MOSCAD. A command can be issued, one repeater at a time for each of the available 10 repeaters on a per site basis. Once activated the repeater will then go into the self repeat Site Failsoft mode.

SETUP

1. Radio to Site/Talkgroup "A" affiliation: **Site 1**
2. Radio 1 (Talkgroup "A" (TGA))
3. Radio 2 (Talkgroup "A" (TGA))
4. Radios 1 and 2 must be programmed with the proper Failsoft Frequency in TGA.
5. The repeater with that frequency must be selected for the test.

TEST INSTRUCTIONS.

6. Disable Main and Back Up Trunking Controllers and verify System Goes into Wide Area Failsoft Single Failsoft Beeps are heard on the test radios.
7. Disable PTT and Audio at the USCI module for chosen channel and verify all repeaters on that channel de-keyed
8. Place the TGA Failsoft Channel into Site Failsoft using the MOSCAD DO screen and Activate the DO command for that channel.
9. Voice test Radios 1 and 2 to verify they can communicate in Site Failsoft mode and Double Failsoft Beeps are heard on the test radios.
10. Restore system to the Trunked mode.

APPENDIX A - TESTING CHECKLIST

Wide Area Trunking Tests

Test #	*Test Description*	*Pass*	*Comment and/or Exception Code*
1	Talkgroup Call		
2	Secure Operation		
3A	Multigroup Call for Wait Mode		
3B	Multigroup Call for Interrupt Mode		
4	Private Call		
5	Call Alert		
6	Emergency Alarm/Call		
7	Busy Queuing/Callback 10 Talkgroup Levels		

Wide Area Trunking Tests

Test #	*Test Description*	*Pass*	*Comment and/or Exception Code*
8A	Non-Priority Scan		
8B	Priority Scan		
9	Automatic Retry		
11	Continuous Assignment Updating		
12A	"Individual Only" Site Access Denial		
12B	"Talkgroup Only" Site Access Denial		
12C	"Either" Site Access Denial		

Wide Area Trunking Tests

Test #	*Test Description*	*Pass*	*Comment and/or Exception Code*
12D	"Both" Site Access Denial		
15	Audio Interrupt		
16	Recent User Priority		

Console Tests

Test #	*Test Description*	*Pass*	*Comment and/or Exception Code*
1	Talkgroup Selection and Call		
2	Console ASTRO Secure Talkgroup Operation		
3	Multigroup Call		
4	Trunking Patch		
h5	Multi-Select/APB		

6	Console Initiated Private Call		
7	Emergency Alarm and Call Display		
8	Console Priority		

Console Tests continued

Test #	*Test Description*	*Pass*	*Comment and/or Exception Code*
9	PTT Unit ID/Alias Display		
10	Alert Tones		
11	Remote Monitor		

Site Trunking Tests

Test #	*Test Description*	*Pass*	*Comment and/or Exception Code*
1	Talkgroup Call		
2	Private Call		
3	Call Alert		
4	Busy Queuing and Callback		
5	Emergency Call and Alarm		
6	Continuous Assignment Updating		

System Management Tests

Test #	*Test Description*	*Pass*	*Comment and/or Exception Code*
1A	Site Path Failure		
1B	Ambassador Link Failure		
2	Fault Management: Current Status and Diagnostics		
3	Zone Watch		
4	Configuration Management – Subscriber Radio User		
5	Configuration Management – Subscriber Talkgroup		

Report Generation Tests

Test #	*Test Description*	*Pass*	*Comment and/or Exception Code*
1	SpectrumView Reports		
2	Zone Configuration Manager Reports: Infrastructure		
3	UCM Reports		

Radio Control Manager (RCM) Tests

Test #	*Test Description*	*Pass*	*Comment and/or Exception Code*
1	Emergency Alarm Display		
2	Dynamic Regrouping		
3	Storm Plans		
4	Selective Radio Inhibit		
5	Radio Check		
6	Snapshot		
7	Message/Status		

System Reliability/Features Tests

Test #	*Test Description*	*Pass*	*Comment and/or Exception Code*
1	AEB to CEB Redundant Link failure		
2	AEB to Zone Controller Redundant Link Failure		
4	Multiple Control Channels		
5	Subsystem Failsoft		
6	Base Station Identification		
7	Zone Controller Switching		
8	Central Controller Switching		
9	MOSCAD Unattended Shutdown		
10	Individual Repeater Failsoft		

Field Acceptance Test Plan

Field Acceptance Test Plan

4.1.0 ASTRO® SmartZone System

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CSA Field ATP-V8b 4-22-03.doc

Overview

There are many benefits and features offered in a Motorola Trunked radio system. This section provides a functional description of each feature and provides a procedure for testing and demonstration of these feature capabilities. This ATP includes key functional, hardware, and coverage sections. Some of the follow test scripts will be done at the factory staging (CCSI). If those tests are fully passed at CCSI then they will pass in the Field ATP without running the test.

This section is organized by system features. The setups for each test require different numbers of subscribers and programming to exercise each feature's capability. For demonstration purposes, the feature tests will use six subscriber units and programmed with at lest three different Talkgroup/Failsoft assignments referenced A, B, and C. At lest two subscriber units shall be programmed to monitor the systems individual RF channels in the conventional mode. Ideally, the portables will be programmed per the system map if available however generic Talkgroups will be used if the customer has not completed a Talkgroup plan.

TEST SCRIPTS

The following script sheets detail the test procedure to be used for each of the functions tested during this Acceptance Test Plan. The same test may be performed multiple times on different pieces of equipment however; once a specific piece of equipment has passed it will not be repeated. These scripts will insure that the correct procedure is followed to guarantee consistent results. Most of the feature tests are accomplished by simple observation.

The City of Miami Beach operations will be impacted during the installation, optimization, and testing of the new system. A detailed MOP (Method Of Procedure) will be created to minimize the disruptions to the current system. Because Motorola is continually improving upon the system software and hardware, these test scripts at Motorola's discretion may require modification to reflect the current product line. In the effort to minimize the operational impact to the City of Miami Beach, the functional tests shall be preformed only once at the Motorola's CCSI factory facility. Any functional test that cannot be successfully demonstrated at CCSI will be done after permanent installation and optimization is completed. The hardware tests will be done after permanent installation is completed. The coverage test will be done after permanent installation and optimization is completed. If a test is not successful, Motorola will analyze and remedy the problem then repeat only the section of the test that failed.

TEST FORMAT AND PLAN

This is to verify that City of Miami Beach (Customer) and Motorola, Inc. (Vendor) agree on the terms of the Equipment Demonstration and Acceptance Test Plan described in this document.

Motorola Representative _____Date_____

Miami Beach Representative_____Date_____

TEST COMPLETION SIGN OFF

City of Miami Beach and Motorola, Inc. agree that the Equipment Demonstration and Acceptance Test Plan described in this document has been performed and adequately demonstrated with the exception of the "Punch List" items as noted.

Motorola Representative _____Date_____

Miami Beach Representative_____Date_____

ATP Punch List

EXCEPTION RESOLUTION PROCEDURE

For each Failure, Non-compliance, or Out-of-Specification item that is determined by City of Miami Beach and Motorola, a detailed explanation of the item will be recorded as a Punch List Item. The Site, Model No. (if applicable), Serial No. (if applicable), Test Name, Test Checklist ID (if applicable), Date, Target completion Date (if applicable), and the Exception Procedure Code must be filled out for each Punch List Item. The City of Miami Beach and Motorola representatives must initial all Punch List Items.

EXCEPTION PROCEDURES CODES:

1. AI - Accept as Is: This is an exception item minor and does not require any corrective action.

2. CS - Pen and ink Correction to Specifications or procedures: Not an exception item, but recorded for future reference. Delineate corrections to specification or ATP procedure on the Punch List.

3. CI - Critical Item: This is an exception item, which requires correction prior to any system transition/cut-over. Note: If CI is circled them one of the other Exception Codes is required (CM, MA or CR).

4. CM - Corrective action required by Motorola as part of Contract: This is an exception item that falls within Motorola's Contract commitment.

5. MA - Management Action required: This is an exception item disagreement on site, to be resolved by the City of Miami Beach and Motorola Project Management.

6. CR - Change Request with or without additional cost: This is an exception item beyond Motorola's Contract commitment. In this case, the City of Miami Beach monitor may find a problem at a site where the work responsibility is beyond Motorola's Contract work commitment.

All project punch list items are to be resolved as per the CSA. Project punch list items should be sorted by test name as described in the detailed test plan.

ATP PUNCH LIST FORM - CITY OF MIAMI BEACH

Item Number_____ Date ___/___/___

Site_____Test Name_____

Description of Exception:

Model _____Serial _____

Exception Procedure Code: (circle one) **AI** **CI** **CS** **CM** **MA** **CR**

Target Completion Date ___/___/___

City of Miami Beach (sign)_____

Motorola (sign)_____

Date Completed ___/___/___

Resolution Comment

Exception Procedure Codes:

AI - Accept as Is

CI - Critical Item

CS - Pen and ink Correction to Specifications or procedures

CM - Corrective action required by Motorola as part of Contract

MA - Management Action required

CR - Change Request with or without additional cost

SMARTZONE SYSTEM FEATURES

SMARTZONE SYSTEM MANAGEMENT

CONFIGURATION MANAGEMENT SUBSCRIBER-RADIO USER

DESCRIPTION

The Subscriber Configuration Management section of the SmartZone Manager application controls the parameters for all radio users and dispatchers on the SmartZone system. Within the Subscriber section, the Radio User Configuration Window enables the network manager to tailor SmartZone subscribers' capabilities. Features such as Multigroup, Busy Override, Site Wide, Secure, Call Alert, and Telephone Interconnect can be enabled or disabled from the Radio User Configuration Window.

Note: The Radio Configuration Window should be completed before the Radio User Configuration Window because the Serial Number and Unit ID information for each subscriber resides in the Radio Configuration Window.

LOCATION SETUP

Select Talkgroup "A" (TGA) on both radios 1 and 2 and allow affiliation with the simulcast system. Flag both radios to be capable of Call Alert, and Dispatch Calls. Set the "User Enabled" flag to YES for both radios 1 and 2.

TEST INSTRUCTIONS

1. Initiate a TGA call from radio 1 and verify that radio 2 hears the radio 1 audio.

2. Change the User Enabled flag to NO for radio 1 via the SmartZone Manager.

3. Initiate a TGA call from radio 1 and verify that radio 1 receives a reject upon initiating a TGA call because of the change in status of the User Enabled Flag. Verify that radio 2 can still initiate a TGA call.

4. Initiate a Call Alert from radio 2 to radio 1 and verify that radio 2 receives a reject when attempting to Page radio 1. Verify that radio 1 receives a reject upon attempting to Page radio 2.

5. Change the User Enabled flag back to YES for radio 1 via the SmartZone Manager.

6. Initiate a TGA call from radio 1 to verify that radio 1 can now initiate a TGA call.

7. Initiate a Call Alert from radio 1 to radio 2and verify that radio 2 receives the Call Alert.

8. Change the Call Alert Enabled flag to NO for radio 1 via the SmartZone Manager.

9. Initiate a Call Alert from radio 2 to radio 1 and verify that radio 2 receives a reject when attempting to Call Alert radio 1.

10. Change the Call Alert Enabled flag back to YES for radio 1 via the SmartZone Manager.

11. Initiate a Call Alert from radio 2 to radio 1 and verify that radio 1 now receives the Call Alert.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SYSTEM FEATURES

SMARTZONE SYSTEM MANAGEMENT

ZONE WATCH

DESCRIPTION.

ZoneWatch is an administration tool for monitoring radio traffic on a SmartZone system. A SmartZone network manager can use ZoneWatch to analyze traffic patterns for load distribution and troubleshoot radio and site problems. ZoneWatch is used with the SmartZone Manager to view current radio traffic activity for the system. This activity is displayed in graphical format, color-coded for easy identification of the type of activity occurring on the system.

SETUP

Select Talkgroup "A" (TGA) on both radios 1 and 2 and allow affiliation with the simulcast system.

TEST INSTRUCTIONS

1. Select the ZoneWatch application from the SmartZone Manager toolbar.

2. Select a simulcast subsystem to monitor. Use a radio that has a Talkgroup that is. Initiate a Talkgroup call from radio 1.

3. Talkgroup, radio and call type (Group) information is displayed for the assigned channel in simulcast subsystem

4. Initiate a Private Call from radio 1 to radio 2.

5. Talkgroup name, radio user, and call type (Private Call) information is displayed for the current call.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SYSTEM FEATURES

SMARTZONE SYSTEM MANAGEMENT

CONFIGURATION MANAGEMENT SUBSCRIBER-TALKGROUP

DESCRIPTION

The Subscriber Configuration Management section of the SmartZone Manager application controls the parameters for all radio users and dispatchers on the SmartZone system. Within the Subscriber section, the Talkgroup Configuration Window enables the network manager to tailor SmartZone Talkgroup capabilities. Features such as Emergency, Busy Override, Secure, Priority Monitor, and Preempt can be enabled or disabled from the Talkgroup Configuration Window.

SETUP

Select Talkgroup "A" (TGA) on both radios 1 and 2 and allow affiliation with the simulcast system. Set the "Group Enabled" flag to YES for both radios 1 and 2. Set the "Message or Transmission Mode" flag to TRANSMISSION for TGA.

TEST INSTRUCTIONS.

1. Steps 1-5 test the Group Enabled flag.

2. Steps 6-8 test the Message or Transmission Mode flag.

3. Initiate a TGA call from radio 1 and verify that radio 2 hears the radio 1 audio.

4. Change the Group Enabled flag to NO for TGA via the SmartZone Manager.

5. Initiate a TGA call from radio 1 or radio 2 and verify that neither radio can initiate a TGA call because of the change in status of the Group Enabled Flag.

6. Change the Group Enabled flag back to YES for TGA via the SmartZone Manager.

7. Initiate a TGA call from radio 1 and verify that radio 2 hears the radio 1 audio.

8. Initiate a TGA call from radio 1 and verify that radio 2 hears the radio 1 audio. Notice that the channel resource assigned for the TGA call is Transmission Trunked by observing no repeater drop out delay is present when radio 1 stops transmitting. This indicates the controller has immediately released the voice channel resource for the next assignment.

9. Change the Message or Transmission Mode flag to MESSAGE for TGA via the SmartZone Manager.

10. Initiate a TGA call from radio 1. Verify that radio 2 hears the radio 1 audio. Notice that the channel resource assigned for the Talkgroup "A" call is Message Trunked by observing the repeater drop out delay is present after radio 1 stops transmitting. This indicates the controller has delayed the voice channel resource released for a configurable repeater hang time, typically 1 to 2 seconds.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SYSTEM FEATURES

SMARTZONE SYSTEM MANAGEMENT

CONFIGURATION MANAGEMENT, SYSTEM INFRASTRUCTURE-ZONE

DESCRIPTION

The Radio System Infrastructure Configuration Management section of the SmartZone Manager application sets the parameters for each of the system devices in the SmartZone system. Within the Radio System Infrastructure section, the Zone Configuration Window enables the network manager to tailor the general timeout and call parameters for each zone in the SmartZone system. Configuration parameters such as Individual/Talkgroup Default Access Permission, Site-Wide Enabled, and Site Access Denial Type can be manipulated from the Zone Configuration Window. System and call timeout parameters such as Carrier, Message Trunk, Fade, Dispatch Call, and Emergency Call can also be manipulated from the Zone Configuration Window.

SETUP

Select Talkgroup "A" (TGA) on both radios 1 and Console 1. Delete the database record for radio 1 in both the Radio and Radio User Configuration Windows so that the SmartZone system does not have any knowledge of radio 1. Set the "Individual Default Access Permission" flag to NO in the Zone Configuration Window. Set the "Private Call Maximum Call Duration" to be 1 minute.

TEST INSTRUCTIONS.

Steps 1-4 test the Individual Default Access Permission flag.

Steps 5-8 test the Private Call Maximum Call Duration setting.

1. Initiate a TGA call from radio 1.

2. Verify that the SmartZone system rejects the radio 1 call request because radio 1 has not been defined in the SmartZone Radio User database.

3. Change the Individual Default Access Permission flag to YES via the SmartZone Manager.

4. Initiate a TGA call from radio 1 and verify that the SmartZone system permits the radio 1 call request because the system grants radio access using default settings.

5. Define radio 1 in the Radio and Radio User Configuration Windows.

6. Initiate a Private Call from Console 1 to radio 1.

7. Keep the Private Call active until the system disconnects the channel assigned for the Private Call.

8. Verify that after one minute elapses, the system disconnects the Private Call because the maximum call duration has been exceeded.

9. Reset the Private Call Maximum Call Duration setting to be 10 minutes.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SYSTEM FEATURES

SMARTZONE SYSTEM MANAGEMENT

FAULT MANAGEMENT-CURRENT ALERTS

DESCRIPTION

Fault Management information is accessed through pop-up windows and pull-down menus. The many windows within the Fault Management menu manage information for the entire system, for a class of objects, or for one specific object. Fault Management contains the following windows: Alarm/Alert Indicators Window, Current Alert Window, Alert History Window, Current Alarm Window, Alarm History Window, Current Status, Technician Messages Window, and Diagnostics. The Current Alerts screens of Fault Management allow a network administrator to view messages that will notify system maintenance personnel of problems occurring in the system. The Current Alerts screens will display those Alerts that have not yet been acknowledged and deleted by a Zone Manager user. Once Alerts have been deleted, they will appear in the Alert History Screens.

TEST INSTRUCTIONS.

1. Acknowledge and clear all Current Alerts.

2. Disconnect the ZC<-> Site 1 data link in order to create some Alerts. Note: The redundant site link remains active during the performance of this test.

3. Verify that Site 1 transitions to an unknown state in the Current Alerts window.

4. Notice that all radios locked to Site 1 enter Site Trunking mode.

5. Re-establish the ZC<->Site 1 data link.

6. Verify that Site 1 transitions to a Wide Trunking state in the Current Alerts window.

7. Notice that all radios in Site 1 enter Wide Trunking mode.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SYSTEM FEATURES

SMARTZONE SYSTEM MANAGEMENT

BASIC STATISTICS

DESCRIPTION

Basic Statistics reports can be created automatically for dynamic statistical information about the air traffic activity on the SmartZone system. These reports provide assistance with system management, resource planning, usage allocation, and monitoring. All reports are preformatted and summarize air traffic activity for a configured time span.

TEST INSTRUCTIONS

1. Select the Zone Daily Report.

2. This report contains air traffic statistics on the overall SmartZone system. The Zone Summary Report contains statistics for the overall performance of the air traffic and central resources on the SmartZone system

3. Provide Channel Summary.

4. Select the Channel Daily Report.

5. This report contains air traffic statistics for each channel on the SmartZone system.

6. Provide Group Summary.

7. Select the Group Daily Report.

8. This report contains air traffic statistics for individual groups on the SmartZone system.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SYSTEM FEATURES

SMARTZONE SYSTEM MANAGEMENT

SELECTIVE RADIO INHIBIT

DESCRIPTION

The INHIBIT command issued by the SmartZone RCM disables a radio, preventing it from transmitting or receiving any audio. All of the radio's functionality ceases while the SZ RCM inhibits the radio. Once inhibited, the radio cannot be used to monitor voice channels or for any other radio user initiated activity. Note that an inhibited radio still monitors the control channel so that it can be re-enabled with the Revert INHIBIT command. Upon receiving the Revert INHIBIT command from the SZ RCM, the radio returns to its normal operation.

SETUP

Radio to Site/Talkgroup "Affiliations: **Site 1**

Radio 1 (Talkgroup "A" (TGA))

Radio 2 (TGA)

TEST INSTRUCTIONS - REPEAT TEST WITH RADIO TURNED OFF INITIALLY.

1. Verify that radios 1 and 2 can communicate by executing a TGA call.
2. From the SmartZone RCM application, INHIBIT radio 1.
3. Radio 1 appears non-functional.
4. Initiate a TGA call from radio 2.
5. Radio 1 cannot monitor activity from radio 2.
6. Acknowledge the INHIBIT task at the SZ RCM.
7. SZ RCM Task window indicates that the INHIBIT task complete and successful.
8. Undo the INHIBIT on radio 1 with the REVERT INHIBIT command, and initiate a TGA call from radio 2.
9. Radios 1 and 2 can communicate on TGA.

10. Acknowledge the status of the REVERT INHIBIT task at the SZ RCM.

11. The REVERT INHIBIT on radio 1 was complete and successful

12. Power off radio 1, and issue the selective radio INHIBIT command on radio 1.

13. The SZ RCM indicates that radio 1 was not successfully inhibited.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SYSTEM FEATURES

SMARTZONE SYSTEM MANAGEMENT

DYNAMIC REGROUPING AND STORM PLAN

DESCRIPTION

Dynamic Regrouping allows the SmartZone RCM to assign individual radios operating in different Talkgroups to a temporary Talkgroup via the REGROUP command. Network managers or supervisors can override individual radio Talkgroup selections by steering regrouped subscribers to a new Talkgroup containing users, which need to communicate on a temporary basis. After receiving a REGROUP command, a radio will ignore the current setting of the Talkgroup selector and move to the target Talkgroup specified in the Regroup command. Unless the supervisor issues a LOCK command, the radio user can deselect the target Talkgroup by selecting another Talkgroup using the radio selector. A unique location on the radio selector is reserved for the target Talkgroup following a REGROUP command. Dynamic Regrouping assignments can be initiated rapidly, but not instantaneously. Regrouping is best suited for planned activities or occasional changes from normal routines. It is not intended for immediate emergency responses such as high-speed chases or for rapid deployments on a per incident basis. Regrouped radios receiving a second Regroup command will move to the new target Talkgroup specified in the second command. When a regrouped radio receives a REGROUP command, all information pertaining to the previous REGROUP command is lost. An XREGROUP command returns an individual radio to its normal operation. Storm Plans represent any number of preprogrammed Dynamic Regrouping combinations constructed in advance to anticipate a unique need, such as a disaster, or to make a needed adjustment for an infrequent yet repeated event, like a parade or election. When implemented, a Storm Plan will automatically construct a new Talkgroup, containing the radios specified by the stored Dynamic Regrouping command. Storm Plans are deactivated with the XSTORM command.

SETUP

Radio to Site/Talkgroup "Affiliations: **Site 1**

Radio 1 Talkgroup "A" (TGA)

Radio 2 Talkgroup "B" (TGB)

Radio 3 Talkgroup "C" (TGC)

Radios 1 and 2 must be programmed with Dynamic Regrouping capability.

A Storm Plan must be configured in the SmartZone Manager so that Radios 1 and 2 are regrouped to TGC.

TEST INSTRUCTIONS

1. Verify that radio 1 cannot communicate with radio 2 because the two radios have different Talkgroups selected.

2. At the SZ RCM position, issue the REGROUP command to dynamically regroup radios 1 and 2 to TGC.

3. ☐Radios 1-3 can communicate on TGC after the dynamic regrouping.

4. ☐Radio 1 can switch Talkgroup positions.

5. At the SZ RCM position, issue the XREGROUP command to terminate the dynamic regrouping of radios 1 and 2.

6. Return radio 1 to TGA, and initiate the LOCK command to lock the radio 1 selector switch. Verify that radio 1 can still change Talkgroup positions.

7. At the SZ RCM position, issue the REGROUP command to dynamically regroup radios 1 and 2 to TGC.

8. Radios 1-3 can communicate on TGC after the dynamic regrouping.

9. Radio 1 can no longer switch Talkgroup positions.

10. At the SZ RCM position, issue the XREGROUP command to terminate the dynamic regrouping of radios 1 and 2.

11. Provide Storm Plan

12. At the SZ Manager's login screen, type in the appropriate Security Group and Password that the Storm Plan has been set up in. The storm plan is set in a separate Security Group then the Dispatcher(s).

13. Verify that radio 1 on TGA cannot communicate with radio 2 on TGB because the two radios have different Talkgroups selected.

14. At the SZ RCM position, select STORM PLAN from the pull down menu and select the preprogrammed dynamic regrouping of radios 1 and 2 to TGC.

15. Radios 1-3 can communicate on TGC after the Storm Plan execution.

16. At the SZ RCM position, issue the XSTORM command to terminate the Storm Plan with radios

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SYSTEM FEATURES

SMARTZONE SYSTEM MANAGEMENT

SNAPSHOT

DESCRIPTION

Snapshot is a SmartZone RCM command, which allows a system-monitoring operator to inquire about the state of a particular radio including whether the radio is powered on. This status information also includes the serial number of the radio, current Talkgroup/Multigroup and site affiliations, the Regroup, Inhibit, and Selector Lock state of the radio. The Snapshot command does not initiate any communication with the target radio.

SETUP

Radio to Site/Talkgroup "A" affiliation: Site 1

Radio 1 (TGA)

Radio 2 (TGB)

TEST INSTRUCTIONS

1. Select TGA on radio 1 and TGB on radio 2.

2. From the SmartZone RCM terminal, dynamically regroup radios 1 and 2 to Talkgroup C (TGC).

3. At the SmartZone RCM terminal, initiate the Snapshot command for radio 1.

4. The RCM terminal shows radio 1 affiliated to Site 1 and that radio 1's current state is "Regrouped."

5. At the SmartZone RCM terminal, terminate the dynamic regrouping on Radios 1 and 2, and then initiate the Snapshot command for radio 1.

6. Radio 1 shows an affiliation to Site 1, and that its current state is "X regrouped" (not regrouped).

7. At the SmartZone RCM terminal inhibit radio 2 and then initiate the Snapshot command for radio 2.

8. Radio 2 shows an affiliation to Site 1 and that its current state is "Inhibited."

9. At the SmartZone RCM terminal un-inhibit radio 2 and then initiates the Snapshot command for radio 2.

10. Radio 2 shows an affiliation to Site 1, and that its current state is "X inhibited"(not inhibited).

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SYSTEM FEATURES

SMARTZONE SYSTEM MANAGEMENT

EMERGENCY ID DISPLAY WITH ALIAS

DESCRIPTION

The emergency call information that is displayed on the SZ RCM includes the radio alias of the radio that initiated the Emergency Alarm, the Talkgroup that the radio was affiliated to at the time the alarm was sent, and the time the alarm was received.

SETUP

Emergency ID Display

Radio to Site/Talkgroup "A" affiliations: **Site 1**

Radio 1 (TGA) Radio 2 (TGA)

Radio 3 (TGB)

Radios 1 and 3 must possess emergency alarm/call capability and be programmed for tactical emergency operation so that the emergency call occurs on the selected Talkgroup.

TEST INSTRUCTIONS

1. Provide Emergency ID Display.
2. Initiate an Emergency Alarm from radio 1.
3. The SZ RCM displays the Emergency Alarm.
4. Verify that the alarm can be cleared from the RCM terminal.
5. Initiate an Emergency Alarm from radio 2.
6. The SZ RCM displays the Emergency Alarm.
7. Initiate an Emergency Call from radio 3.
8. The SZ RCM displays the Emergency Alarm.

9. Remove Radios 1,2 and 3 from emergency mode.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SYSTEM FEATURES

SMARTZONE SYSTEM MANAGEMENT

RADIO CHECK

DESCRIPTION

Radio Check is a SmartZone RCM command used to verify that a radio is active in the Trunking system. The Radio Check command causes the Zone Controller to poll for the radio to see if it is in the Trunking system, checking the last site at which the radio affiliated. When a radio re-affiliates, the RCM then has the knowledge that the radio is powered on and within system range. If the radio is involved in a conversation, whether group or interconnect, the RCM application displays a message to that effect. The information displayed by the RCM in response to the Radio Check command is: current Talkgroup "A" affiliation, the Multigroup that the Talkgroup is attached to (assuming the Talkgroup belongs to a Multigroup), and the site where the radio is affiliated. If the radio does not respond to the Radio Check command, a message to that effect displays.

SETUP

Radio to Site/Talkgroup "A" affiliations: Site 1

Radios 1-3 Talkgroup "A" (TGA)

TEST INSTRUCTIONS

1. From the RCM terminal, initiate a Radio Check on radio 1.
2. Verify that the RCM displays that radio 1 is affiliated to TGA at Site 1.
3. Shut off the power for radio 3.
4. From the RCM terminal, initiate a Radio Check on radio 3.
5. Verify that the RCM responds with a message stating that radio 3 is not responding (Radio Time Out.
6. Initiate a TGA call from radio 1.
7. From the RCM terminal, initiate a Radio Check on radio 1 while radio is transmitting.
8. Verify that the RCM displays a message stating that radio 1 is involved in a conversation, and indicates a busy.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SYSTEM FEATURES

SMARTZONE SYSTEM MANAGEMENT

BASIC LOGIN PROTECTION

DESCRIPTION

The SmartZone Manager/RCM applications have password protection to prevent unauthorized persons from gaining access to the SmartZone system management network. Accessing either the Manager or Dispatcher application requires entering a valid login ID and password.

TEST INSTRUCTIONS

1. Enter a login ID and an incorrect password in the Login dialog box.
2. Verify that the system rejects the incorrect login request.
3. Enter a valid login ID and password in the Login dialog box.
4. Verify that the X-terminal displays the SmartZone application toolbar.
5. Click on EXIT to exit from the SmartZone application environment.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SYSTEM FEATURES

SMARTZONE SYSTEM MANAGEMENT

SMARTZONE FAILSOFT VIA SMARTZONE MANAGER

DESCRIPTION

Failure of all control channels, failure of all voice channels, or failure of the subsystem or site controller will cause a SmartZone subsystem to enter Failsoft operations. SmartZone subscribers can be programmed to operate in Failsoft by Talkgroup; to search its list of control channel frequencies in Failsoft; or to disable Failsoft altogether. When a system enters Failsoft, a radio programmed for Failsoft by Talkgroup will first look for a specific Failsoft channel dictated by the selected Talkgroup. Since many SmartZone systems have different frequencies across sites, if a SmartZone radio is unable to find the Talkgroup's Failsoft channel the radio will instead operate in the control channel search Failsoft mode. A radio programmed or needing to search control channels for Failsoft frequencies will lock onto the lowest frequency control channel at the site.

Notes: SmartZone radios should not be site locked when in Failsoft mode as the radio will not check the full list of 32 control channels programmed into the radio's code plug. All radios should be programmed to have the same sequence of control channel frequencies.

SETUP

Ensure that the radios are all affiliated to the same SmartZone site. Program radio 1 for Failsoft operation by Talkgroup.

TEST INSTRUCTIONS.

1. Using the SmartZone Manager put the system into Failsoft mode. Radios operate according to their Failsoft programming scheme (Failsoft by Talkgroup, Failsoft by personality, or Failsoft disabled).

2. Initiate a Talkgroup call from radio 1 while in Failsoft mode. • Radio 1 emits a Failsoft tone approximately once every ten seconds. Radio 1 operates on the correct Failsoft channel for its selected Talkgroup (TGA).

3. Disable the Failsoft channel associated with TGA (determined in radio 1's programming). Radio 1 searches its control channel list for a suitable Failsoft channel since the original TGA channel has been disabled.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SYSTEM FEATURES

SMARTZONE SYSTEM MANAGEMENT

SMARTZONE FAILSOFT VIA CONTROL CHANNEL FAIL

DESCRIPTION.

Failure of all control channels, failure of all voice channels, or failure of both simulcast prime site controllers will cause the simulcast subsystem to enter Failsoft operations. For the purposes of this test, one of the subsystems will be put into Failsoft without using the SZ Manager to accomplish this task.

SETUP.

Radios operate according to their Failsoft programming scheme (Failsoft by Talkgroup, Failsoft by personality, or Failsoft disabled). For this test Failsoft by Talkgroup is assumed. Ensure that the radio 1 and 2 are affiliated to the Simulcast System and the radios are programmed for Failsoft operation by Talkgroup. A service monitor or conventional mode radio shall be used to verify Failsoft by Talkgroup channel assignments are correct.

TEST INSTRUCTIONS.

1. Provide Failsoft Operation.

2. On each of the MTC3600 Central Site Controllers, disable each of the control channels to force the System into Failsoft.

3. Radio 1 and 2 emit a Failsoft tone approximately once every ten seconds.

4. Initiate a Talkgroup call from radio 1 while in Failsoft mode.

5. Radio 1 operates on the correct Failsoft channel for its selected Talkgroup (TGA). Radio 2 hears call.

6. Initiate a Talkgroup call from radio 2 while in Failsoft mode.

7. Radio 2 operates on the correct Failsoft channel for its selected Talkgroup (TGA). Radio 1 hears call.

8. Repeat steps 2 and 3 for various Talkgroups.

9. Restore the normal Trunking mode to the system. Radios 1 and 2 no longer emit Failsoft tone System Returns to Wide Area

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SYSTEM FEATURES

SMARTZONE SYSTEM MANAGEMENT

REDUNDANT ZONE CONTROLLER TO AUDIO SWITCH LINKS

DESCRIPTION

A redundant link between the Zone Controller and the Audio Switch (AEB) allows hot standby takeover if the active link fails, ensuring uninterrupted service of the SmartZone system and call switching by the AEB. A failure of both links between the Zone Controller and AEB causes the Zone Controller to force all sites into Site Trunking.

TEST INSTRUCTIONS.

1. Provide Redundant Zone Controller to Audio Switch Links.
2. Delete all alarms associated with the AEB at the SmartZone Manager terminal.
3. Disconnect one of the AEB to Zone Controller (ZAMBI<->ZC) links.
4. The SmartZone Manager emits an audible beep indicating an alarm/alert condition.
5. System remains in Wide Area Trunking.
6. Replace the first ZAMBI link and then disconnect the second ZAMBI link.
7. The SmartZone Manager emits an audible beep indicating an alarm/alert condition.
8. System remains in Wide Area Trunking.
9. Disconnect both links between the Zone Controller and AEB.
10. The SmartZone Manager emits an audible beep indicating an alarm/alert condition.
11. The Alert screen indicates the AEB is unknown. All AEB Mux Slots will transition to an unknown state forcing the SmartZone system to Site Trunking mode.
12. Reconnect one of the ZAMBI links and refresh the Current Alerts screen.
13. The Current Alerts screen indicates that the AEB slots are now active.

14. SmartZone sites return to Wide Trunking mode.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SYSTEM FEATURES

SMARTZONE SYSTEM MANAGEMENT

REDUNDANT EQUIPPED ZONE CONTROLLER

DESCRIPTION

The Motorola MZC 3000 SmartZone Controller is a redundant system that provides trunking call processing during single point failures. These failures might include failures to the CPU card, Hard Disk Drive, Asynchronous and Synchronous cards, and Power Supply module. The redundant MCZ 3000 Zone controller includes two Compact PCI chassis units.

SETUP

Three radios are required to perform this test (Radios 1, 2 and 3). All Radios should be selected to Talkgroup A.

Test

User Initiated Switchover

Step 1. While the system is in wide area operation, verify all radios are on the same talkgroup.

Step 2. Verify in the Zone Configuration Manager (ZCM) that the switchover mode is user-initiated.

Step 3. Switch the Zone Controllers from the ZCM.

Step 4. Verify that the backup Zone Controller becomes active and brings all sites back wide within 2 minutes.

Step 5. Key Radio 1 and verifying that the other 2 radios hear the audio.

Step 6. End the call from Radio 1.

Automatic Switchover

Step 7. Set the switchover mode to automatic through the ZCM.

Step 8. Pull the loopback cable on the Sync Card on the active Zone Controller.

Step 9. Verify that the backup Zone Controller becomes active and brings all sites back wide within 2 minutes.

Step 10. Key Radio 1 and verifying that the other 2 radios hear the audio.

Step 11. End the call from Radio 1.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SYSTEM FEATURES

SMARTZONE CONTROLLER TO SUBSYSTEM

CONTROLLER DATA LINK FAILURE

DESCRIPTION.

Subsystem site controllers communicate to the Zone Controller via dedicated RS232 data links. Through this dedicated data link, the Zone Controller manages the subsystem resources. In the event that this dedicated data link fails, the Zone Controller loses the ability to manage the subsystem altogether resulting in the SmartZone site entering Site Trunking mode. The SmartZone Manager will notify the network administrator of a site data link failure through the Current Alarms/Alerts screens.

TEST INSTRUCTIONS.

1. Verify that all SmartZone sites are in Wide Trunking mode.
2. Site lock radio 1 to SmartZone Site 1.
3. Disconnect the site data links at Site 1. Radio 1 enters Site Trunking mode.
4. The SmartZone Manager Current Alarms/Alerts indicate that Site 1 is unknown.
5. Reconnect the site data links at Site 1.Radio 1 enters Wide Trunking mode.
6. The SmartZone Manager Current Alarms/Alerts indicate that Site 1 is Wide Trunking.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SYSTEM FEATURES

SMARTZONE CONTROLLER TO SUBSYSTEM

BACKUP CONTROL CHANNELS

DESCRIPTION.

A maximum of four channels are eligible for assignment as control channel in each SmartZone site. In the event that the assigned control channel fails at any remote site, the Zone controller automatically selects one of the other control capable channels as the active control channel for that site. A Control Channel Preference Level can be used to rank the control capable channels where channel 1 is the highest ranking and channel 4 is the lowest.

TEST INSTRUCTIONS.

1. Choose a SmartZone site to analyze control channel rotation, and verify that channel 1 is the active control channel.

2. Disable channel 1. SmartZone site remains in Wide Trunking mode.

3. Verify that the next highest preferred control capable channel (assumption is channel 2) becomes the active control channel.

4. Disable channel 2. SmartZone site remains in Wide Trunking mode.

5. Verify that the next highest preferred control capable channel (assumption is channel 3) becomes the active control channel.

6. Disable channel 3. SmartZone site remains in Wide Trunking mode. Verify that the next highest preferred control capable channel (assumption is channel 4) becomes the active control channel.

7. Enable channels 1-3.

8. Assuming a Control Channel Preference ranking of 1 for channel 1, channel 1 will be selected as the active control channel.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SYSTEM FEATURES

SMARTZONE CONTROLLER TO SUBSYSTEM

INDIVIDUAL REPEATER FAILSOFT

DESCRIPTION

Individual repeater Failsoft allows the 10 available repeaters at a site to be manually placed in the Failsoft mode via MOSCAD. A command can be issued, one repeater at a time for each of the available 10 repeaters on a per site basis. Once activated the repeater will then go into the self repeat Site Failsoft mode.

SETUP

1. Radio to Site/Talkgroup "A" affiliation: **Site 1**
2. Radio 1 (Talkgroup "A" (TGA))
3. Radio 2 (Talkgroup "A" (TGA))
4. Radios 1 and 2 must be programmed with the proper Failsoft Frequency in TGA.
5. The repeater with that frequency must be selected for the test.

TEST INSTRUCTIONS.

6. Disable Main and Back Up Trunking Controllers and verify System Goes into Wide Area Failsoft Single Failsoft Beeps are heard on the test radios.
7. Disable PTT and Audio at all USCI modules for chosen channel and verify all repeaters on that channel will de-key
8. Place the TGA Failsoft Channel into Site Failsoft using the MOSCAD DO screen. Activate the DO for that channel.
9. Voice test Radios 1 and 2 to verify they can communicate in Site Failsoft mode. Double Failsoft Beeps are heard on the test radios.
10. Restore system to the Trunked mode.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SYSTEM FEATURES

SMARTZONE CONTROLLER TO SUBSYSTEM

REMOTE SITE CONTROLLER FAULT TEST

DESCRIPTION

The purpose of this test is to prove that if a Remote Site Controller fails at one of the sites, the site will continue to transmit Trunked audio.

SETUP

For this test the following conditions must be met:

The Trunked system is operating in Wide Area.

A portable on a Talkgroup that is being monitored by the consoles

A console listening to the Talkgroup

Three people will be required to conduct the test. One will go to the site being tested with portable #1, while the other two will be at a Console and with portable #2.

TEST INSTRUCTIONS

1. Transmit and hold down PTT switch on portable #1. Give test count. Portable #2 hears test count Console hears test count

2. With portable #1 continuing to transmit, power down Remote Site Controller Alarm is given on SZ Manager

3. Portable #2 hears portable #1 with no loss of transmission Entire System continues to trunk

4. Console gives test count on Talkgroup Portables 1 and 2 hear test count.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SYSTEM FEATURES

SMARTZONE CONTROLLER TO SUBSYSTEM

CEB LINK FAULT TEST

DESCRIPTION

The purpose of this test is to prove reliability of the CEB links.

SETUP

For this test the following conditions must be met: The Trunking system is operating normally.

TEST INSTRUCTIONS

1. With a console tied to the CEB, transmit and hold on Talkgroup Test Radio hears console

2. With the console still keyed, disable the Active AIMI board in the CEB Other AIMI board takes over Alarm is given Test Radio continues to hear console. There will be a loss of a few syllables.

3. Disable COIM in CEB Console connected to COIM doesn't work Other OPS continue to communicate on system.

Pass Y N Punch list Item # _____

Comments: _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SYSTEM FEATURES

SMARTZONE CONTROLLER TO SUBSYSTEM

ASTRO-TAC FAULT TEST

DESCRIPTION

The purpose of this test is to prove that if a single AstroTac 3000 fails, that the channel is removed from service but rest of the system resources continue to operate normally.

SETUP

The Trunking system is operating normally.

TEST INSTRUCTIONS

1. Channel X ASTROTAC3000 is powered down.
2. Channel is removed from service
3. An alarm is given on SZ Manager System
4. The system continues to trunk on the remaining channels

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SYSTEM FEATURES

SMARTZONE CONTROLLER TO SUBSYSTEM

RECEIVER INTERFERENCE SHUTDOWN

DESCRIPTION

Receiver interference occurs when a repeater receives an unauthorized signal. In order to prevent a disruption of communications, the central controller will remove the affected channel from the Trunked system selection/assignment process when it detects an undesired carrier for longer than the specified time-out period. Once the interfering carrier disappears, the channel is eventually returned to service (10 sec to 5 minutes).

TEST INSTRUCTIONS

1. Using a service monitor, transmit a 1 kHz tone at the receive frequency of any repeater station.

2. Central controller removes the channel from service per the carrier malfunction time parameter default.

3. Continue to transmit the 1 kHz tone until the controller removes the channel from service (timer is configurable at the Site level through the Carrier Malfunction Time parameter).

4. At the SmartZone Manager terminal, channel malfunction due to interfering carrier is indicated on the Current Alerts screen.

5. Remove the interfering signal. Channel is returned to service within approximately five minutes and the SmartZone Manager indicates that the channel is now enabled.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

FAULT MANAGEMENT SYSTEM FEATURES

SCREEN NAVIGATION

LOGIN AND PASSWORD SCREEN

For system staging the "Login Name" is ***Administrator*** and the "Login Password" is ***Wonderware***. Enter this text and verify this allows access to the "main" screen.

MAIN SCREEN

The "Main" screen typically contains site name buttons with color status bullets adjacent to the site name buttons. If there are more site names that can be fit on one screen, a "margin tab label" will allow access of additional sites. The "margin tab labels" are used to easily navigate the user to any graphical information associated with the system. More details of a particular site can be achieved by selecting the site name of interest. If there is an alarm within any given site(s), the color bullet will flash in red for the site(s), which originate the alarm.

COMMUNICATION SCREENS

From the "Main" screen access the "communication" screen tab

Verify that the communication screen represents the system CPU configuration, that the active CPU's have a green (normal) communication status, and that the naming is correct.

ALARM SUMMARY SCREENS

Proceed to the Alarm Summary Screen by selecting the appropriate margin tab. On this screen verify that you can select between the alarm summary detail and the alarm history detail by activating the "Alarm Summary/Alarm History" button. Create an event and verify the display information. Return to the "Main" screen.

DIGITAL INPUT SCREENS

From the "Main" screen select any site and then the Digital Input margin tab. Verify names and create several alarms and observe the indications. If there are more than 32 digital inputs use the margin tab on the right of the screen to access additional digital inputs and create several alarms in this group as well. Acknowledge any alarm and confirm the acknowledge function.

CHANNEL BANK ALARMS (TENSR) STATUS SCREENS

If applicable, select the margin tab for the channel bank units at the site. Create/simulate several alarms and note the module(s) with the alarm. Click on the "alarming" module (card) to pull up the module detail. Note the alarm information and "Ack" the alarm. Access other channel banks at the site (if applicable) by utilizing the right side margin tabs. Verify the information as you did with the first unit.

DIGITAL OUTPUT SCREENS

Select the "digital output" margin tab. Verify the functions and function names. Activate several controls and verify by monitoring the control via the led readout and the actual equipment under control if wired in. Also confirm change of state by reading status on the digital input screed for equipment that is wired for control/status operation. Where there are more digital output icons than can be fit on the screen, select additional outputs using the right side margin tabs and confirm operation as before.

QUANTAR STATUS AND CONTROL SCREENS

If applicable, select the margin tab for the Quantar units at the site. Verify the status and controls by creating/simulating several alarms and activating several of the controls. Verify selection of any Quantar at the site under test by utilizing the right side margin tabs and repeat alarm/control spot check.

ANALOG INPUT SCREENS

If applicable, select the analog input margin tab. The analog input is primarily used for RF power readings at the transmitter combiner directional coupler. Verify the analog reading by noting changes in value, as various repeaters are key up and down.

GPS/RUBIDIUM STANDARD STATUS SCREENS

Access the GPS/Rubidium Standard screen, if applicable, via the margin tab. Create/simulate several alarms and confirm status, "Ack" the alarm(s) and confirm.

OTHER SITES

Return to the "Main" screen, select the other sites of the system, and verify access to all pertinent screens.

This concludes the screen navigation portion of the test.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

FAULT MANAGEMENT SYSTEM FEATURES

ALARM FUNCTIONS

ALARM PROCESSING

DESCRIPTION

This segment of the test verifies that the bi-state site alarms are processed and communicated to the Front End Processor (FEP) and the Graphic Workstation. The alarms can originate from a device with "hard wired" physical dry contact interfacing or from a device connected to the MOSCAD CPU by means of an RS232 interface. This verification should be done for some (typically 3 or 4) alarms to insure that all the processing is performed as expected. The following check list is a walk thru of the alarm processing sequence:

TEST INSTRUCTIONS

1. Create an alarm condition by simulating an alarm on a device in the system or shorting/opening a status input to any MOSCAD status input module in the system.

2. Navigate to the lowest level screen that depicts the highest degree of alarm detail.

3. Verify that the "state" text for the associated alarm on the Graphic Workstation is blinking red and that the "state" text displayed is for the correct alarm point and site.

4. Verify that an audible indication is heard at the Graphic Workstation.

5. Verify that the alarm indication is displayed on the event printer output.

6. Verify that the alarm displays in red text on the Alarm Summary window.

7. Click with the mouse on the "acknowledge" button. Verify that the audible indication is silenced.

8. Verify that the text on the alarm summary window of the Graphic Workstation changes from red to blue.

9. Verify that the acknowledge event is recorded at the printer output.

10. Verify that the "state" text of the alarm on the graphic workstation remains red but stops blinking.

11. Return the alarm point to the normal condition. Verify that the "state" text returns to green at the Graphic Workstation.

12. At the Graphic Workstation, verify that the text is removed from the alarm summary window.

13. Verify that the "return to normal" state is recorded on the printer output.

14. Again create an alarm condition by simulating an alarm on a device in the system or shorting/opening a status input to any MOSCAD status input module in the system.

15. View the alarm summary window and verify red text for the alarm

16. Verify the audible alert at the Graphic Work Station is present.

17. Verify that the alarm indication is recorded at the printer output.

18. Without acknowledging, reset the alarm return the alarm point to its normal condition.

19. Verify that the indication is recorded at the printer output.

20. Verify the text on the alarm summary window of the Graphic Workstation has changed from red to gray indicating an unacknowledged alarm that has returned to normal.

21. Verify the alert tone is off.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

FAULT MANAGEMENT SYSTEM FEATURES

ALARM FUNCTIONS

LOCAL I/O PHYSICAL

The purpose of this section is to verify that the physical inputs and outputs that interface to the MOSCAD I/O modules are properly processed by the MOSCAD system. Status inputs are tested from the punch block termination interface. The status can be simulated by shorting/opening the input to/from the MOSCAD ground reference or by creating the actual condition with the actual device being monitored. Observing the response at the graphic workstation makes the verification. For digital outputs (controls) the equipment under control can be monitored for proper response to the control. If the equipment under control is not available or if the controls are unused, the LED indicators on the MOSCAD digital output modules can be monitored for prior response. The controls are initiated from the graphic workstation. Analog inputs are verified by comparing readings on the graphic workstation to the measured level using measuring devices such as watt meters or volt/current meters. The tables below identify the I/O by type, function, and response for each location where physical I/O exists.

STATUS INPUTS

-DI # refers to the Digital Input assignment number

-Description is the name of the status as displayed on the screen, source document is MOSCAD DSI for system

-NO=Normally open dry contact

-NC=Normally closed dry contact

-Normal text is the text displayed in the normal state

-Alarm text is the text displayed in the alarm state

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

FAULT MANAGEMENT SYSTEM FEATURES

ALARM FUNCTIONS

CONTROL OUTPUTS

-DO Refers to the Digital Output assignment number

-Description is the name of the status as displayed on the screen, source document is MOSCAD DSI for system

-Relay state NC=Normally Closed

-Relay state NO=Normally Open

-Closure Type Mom=Momentary closure

-Closure Type Latch=Latched closure

Pass Y N Punch list Item # _____

Comments: _____

Initials: Motorola _____ Customer _____

Test comments on the back.

FAULT MANAGEMENT SYSTEM FEATURES

ALARM FUNCTIONS

ANALOG INPUTS

AI# Refers to the Analog Input assignment number

Description is the name of the status as displayed on the screen, source document is MOSCAD DSI for system

Input Type refers to Voltage (i.e. 0-5VDC) or Current (4-20 mA)

Analog Value Displayed is the unit of measure (i.e. watts)

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

FAULT MANAGEMENT SYSTEM FEATURES

DIAGNOSTICS FUNCTIONS

QUANTAR

The following is a list of status and control information pertaining to the Quantar unit that is displayed on the Graphic WorkStation. Verification is accomplished by simulating or creating some/all of the statuses/ controls. Refer to the alarm processing section to verify proper processing of the alarms. This is done for each Quantar radio at each site.

Quantar/Quantro Radio Statuses	Comm. Status FPM Validity PA Full Status PA On Status Access Disable Rx Fail Rx Lock WL Fail WL On AC Power Control CH Status PA Fail Tx Lock
Quantar/Quantro Analog Values	Forward Power

	Reflected Power VSWR Keyed Forward Power Keyed Reflected Power Keyed VSWR
Quantar/Quantro Controls	Key De-key Reset Access Disable on Access Disable off
Pass/Fail	Customer Signature_____

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

FAULT MANAGEMENT SYSTEM FEATURES

DIAGNOSTICS FUNCTIONS

TENSR CHANNEL BANK DIAGNOSTICS

The MOSCAD system will connect to each TeNSr channel bank via its computer port 9-pin D connector along the rear of the INF (Interface) module and requires a dedicated MOSCAD CPU RS-232 port (port 2 or 3). The MOSCAD will be in a "listen-only" mode, where it will continuously monitor for any alarm messages that the TeNSr channel bank sends to the CPU. Alarm messages will then be converted to native MOSCAD data format for transmission to the control center. The channel bank can have up to 28 modular circuits monitored, though in most cases it will be a subset of this maximum. Verification is accomplished by simulating or creating some/all of the statuses. Refer to the alarm processing section to verify proper processing of the alarms. This is done for each channel bank at each site.

TeNSr Channel Bank Statuses	**OOS** --- Out of Service **NOS** --- No Signal **LOS** --- Loss of Synch **YEL** --- Yellow Alarm **AIS** --- Alarm Info Signal **CGA_RED** --- Red Carrier Group **CGA_YEL_** --- Yellow Carrier Group **EER** --- Excessive Error Rate **SENSOR** --- Sensor SWITCH--- Switch **UCA** --- User Card/Port Alarm

	RESET --- System Reset **ACO** --- Alarm Cut Off **SYNC** --- Clock Sync Alarm **SAIS** --- Send Alarm Info Signal **DCHAN** --- D-Channel out of Service

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

FAULT MANAGEMENT SYSTEM FEATURES

DIAGNOSTICS FUNCTIONS

TENSR CHANNEL BANK CONFIGURATION

At the Graphic WorkStation minimize the InTouch application and open the terminal application (VT100 mode) associated with the computer. Depress the F1 key and key in the Channel Bank ID nomenclature (hard copy reference table provided). This should open the link to the desired channel bank. Verify connection by validating date/time/serial number. Depress F2 to logoff.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

FAULT MANAGEMENT SYSTEM FEATURES

DIAGNOSTICS FUNCTIONS

GPS/RUBIDIUM STANDARD

The MOSCAD system will connect to each GPS/Rubidium Standard via its RS232 port 9-pin D connector and requires a dedicated MOSCAD CPU RS-232 port (port 2 or 3). The MOSCAD will be in a "listen-only" mode, where it will continuously monitor for any alarm messages that the Rubidium Standard sends to the CPU. Alarm messages are then converted to native MOSCAD data format for transmission to the control center. The default sets of alarms are listed below. Create/Simulate an alarm and verify that the alarm is processed properly as described in the Alarm Processing section.

GPS/Rubidium Standard Statuses	**DI01**---Locked **DI02** --- Free Running **DI03** --- Rubidium Unlock **DI04** --- Warm-up **DI05** --- Warm-up ended

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

FAULT MANAGEMENT SYSTEM FEATURES

DIAGNOSTICS FUNCTIONS

CENTRAL REDUNDANCY

This portion of the test is for systems that have more than one central where the multiple centrals are considered redundant.

Verify that the redundant multiple centrals display identical information by comparing alarm report printouts or alarm summary. Take down or disconnect one central from the system and verify status and control from the other two are still achievable. Bring up the disconnected Central and verify that the information is updated to reflect the current state of the system.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

FAULT MANAGEMENT SYSTEM FEATURES

DIAGNOSTICS FUNCTIONS

ASTROTAC RECEIVER ALARMS

DESCRIPTION/ METHODOLOGY

The purpose of this test is to verify that a user invoked ASTRO-TAC Receiver alarm can be verified at the GMC. The user is asked to create two ASTRO-TAC Receiver alarm statuses at any one of the Receiver sites. At the conclusion of this test, the user will have a basic understanding of the ASTRO-TAC Receiver alarm statuses.

TEST PROCEDURES

Wire Line Fail:

Step 1. Choose the channel and site to perform test.

Step 2. Verify that there are no current alarms for the chosen receiver.

Step 3. Remove the V.24 connection on the chosen receiver.

Step 4. At the GMC, select the ASTRO-TAC Receiver tab.

Step 5. Verify that the alarm is received at the GMC.

Step 6. Acknowledge the alarm.

Step 7. Replace the V.24 connection at the receiver.

Step 8. Verify that the receiver returns to normal.

Receiver Lock:

Step 1. Choose the channel and site to perform test.

Step 2. Verify that there are no current alarms for the chosen receiver.

Step 3. Disconnect the cable between the chosen receiver and Frequency Standard.

Step 4. At the GMC, select the ASTRO-TAC Receiver tab.

Step 5. Verify that the alarm is received at the GMC.

Step 6. Acknowledge the alarm.

Step 7. Reconnect the cable between the receiver and Frequency Standard.

Step 8. Verify that the receiver returns to normal.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

FAULT MANAGEMENT SYSTEM FEATURES

DIAGNOSTICS FUNCTIONS

ASTROTAC 3000 COMPARATOR ALARMS

DESCRIPTION/ METHODOLOGY

The purpose of this test is to verify that a user invoked ASTRO-TAC 3000 Comparator alarm can be verified at the GMC. The user will asked to create two ASTRO-TAC 3000 Comparator alarm statuses at any one of the three voter sites. At the conclusion of this test, the user will have a basic understanding of the ASTRO-TAC 3000 Comparator alarm statuses.

AstroTac Comparator Alarms	Comparator - Box Reset
	Comparator - Box Reset WL Reset
	Comparator – Box Reset SW Ver. Mismatch
	Comparator – Box Reset by RSS
	Comparator – Box Reset HDLC Bus Error
	Comparator Control Card Undetected
	Comparator Control Card Undetected
	Wireline Card 1 WL reset
	Wireline Card 1 WL absent
	Wireline Card 1 via RSS
	PORT #1 – State Mgr – Link failed
	PORT #1 - HW Manager – Modem failed
	PORT #1 – Error Manager CRC Error

	PORT #1 – Operation Manager via RSS Remote Status Port - (Conv. Systems Only) link failed Power Supply battery revert

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

FAULT MANAGEMENT SYSTEM FEATURES

DIAGNOSTICS FUNCTIONS

DIU 3000 ALARMS

DESCRIPTION/ METHODOLOGY

The purpose of this test is to verify that a user invoked DIU 3000 alarm can be verified at the GMC. The user will be asked to create two DIU 3000 alarm statuses. At the conclusion of this test, the user will have a basic understanding of the DIU 3000 alarm statuses.

DIU Statuses & Alarms	Problem with sys calls
	Could not set wireline
	Could not set attenuator
	Unexpected inner task message
	Could not set analog matrix
	Cannot update infrastructure Database
	Fail to receive start message
	Bad communication with DSP1
	Bad communication with EMC
	Could not get ESYNC from EMC
	Bad communication with DSP2
	Receive SABM frame
	Link establishment O.K
	Link failure

	Analog timeout EMC status timeout Receive SABM frame from RNC Link establishment with RNC O.K RNC Link failure No Receive Ready from Base HLM: DIU-Base link is down HLM: DIU-Base link is up HLM: DIU-Console link is down HLM: DIU-Console link is up ACIM link is down ACIM link is up DIU reset occurred

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

FAULT MANAGEMENT SYSTEM FEATURES

DIAGNOSTICS FUNCTIONS

CENTRAL ELECTRONICS BANK (CEB) ALARMS

DESCRIPTION/ METHODOLOGY

The purpose of this test is to verify that a user invoked CEB alarm can be verified at the GMC. The user will be asked to create two CEB alarm statuses. At the conclusion of this test, the user will have a basic understanding of the CEB alarm statuses.

CEB Statuses & Alarms	

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

CONCLUSION AND ACCEPTANCE

This concludes the Acceptance Test Plan for the MOSCAD Fault Management System. Any failed items of this test plan are to be documented in a punch list format by the Motorola Project Manager. These items will be corrected and re-tested in accordance with the ATP. The successful completion of this test plan demonstrates the performance of the required functionality of equipment and services provided by Motorola and constitutes system acceptance. Signature by all representatives listed below acknowledges the successful completion of this Acceptance Test Plan.

MOSCAD PRODUCT GROUP REPRESENTATIVE:

(Print Full Name)_____

(Signature)_____

Motorola Representative:

(Print Full Name)_____

(Signature)_____

Customer Representative:

(Print Full Name)_____

(Signature)_____

SIMULCAST TRUNKING SYSTEM

SMARTNET FEATURES

CALL ALERT

DESCRIPTION

Call alert allows a dispatcher or radio user to selectively alert an individual so they know that someone is trying to reach them. To initiate a Call Alert (Call Alert) the dispatcher or radio user switches the radio to the Call Alert mode and selects the individual to be called.

Pushing the PTT switch sends the Call Alert. The Call Alert produces an audible and visual alert (depending on the radio) on the receiving portable radio. The alert indicators stop when the Call Alert receiver presses their PTT. Indicators on the initiating caller's radio automatically acknowledge receipt of the alert by the alerted radio unit. All of this is accomplished through signaling over the control channel and does not affect voice channel efficiency.

The receiving unit of a Call Alert will display and can store the calling party's ID. This is achieved through the transmission of a dual word message, which identifies the caller and the receiver. This allows the receiver to know who initiated the Call Alert.

Five different Call Alert programming alternatives are available for mobile and portable radios.

Decode only (can receive but cannot initiate a Call Alert)

Encode response (can call back the user that initiated the call)

Single encode (can Call Alert one predetermined radio only)

Multiple encode, (can Call Alert up to eight predetermined radios)

Unlimited (can Call Alert any other radio in the fleet which is Call Alert capable)

The dispatchers can Call Alert any Call Alert enabled radios. Call Alerts can also be sent from SIMS or Trunked ID Processors.

TEST INSTRUCTIONS

1. Initiate a Call Alert from a console to any subscriber unit in the system.

2. Observe that only the radio being called receives a call alert tone, and that the sender's ID is properly displayed.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SIMULCAST TRUNKING SYSTEM

SMARTNET FEATURES

BUSY QUEUING AND CALLBACK

DESCRIPTION

Although Trunked systems are considerably more efficient than a conventional system, there may still be times when all of the voice channels are busy or when channels with special call processing capabilities are busy. If a radio user transmits while all the system channels are in use, he or she will hear a series of busy tones until a channel is assigned, or the PTT button is released.

For convenience, any users requesting system access during a busy period will be put in a queue on a FIFO (first in first out) basis. When a channel does become available, the system central controller will notify the first user by calling him back. A talk permit tone heard on the operators' radio alerting the user of the callback and holds the channel for approximately 2 seconds. This feature allows the radio user to put the microphone down in a busy situation and wait for the callback instead of continually keying in an effort to gain channel access.

TEST INSTRUCTIONS

1. Disable all but one voice channel.

2. Press push-to-talk (PTT) of a subscriber unit from Talkgroup A and hold the PTT key. This will capture the remaining voice channel in the system.

3. Key a radio from Talkgroup B, and then key a radio from Talkgroup C. Both radios will receive a busy tone.

4. Release the PTT key of the Talkgroup A radio. The Talkgroup B radio should receive a callback tone.

5. Release the PTT key of the Talkgroup B radio. The Talkgroup C radio should receive a callback tone.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SIMULCAST TRUNKING SYSTEM

SMARTNET FEATURES

ANNOUNCEMENT GROUP CALL

DESCRIPTION

An announcement group call is the feature used to make a Multi-group call on SMARTNET II systems.

The announcement group call can be set up to work one of two ways. In one set up, the initiating user must wait for the others in their announcement group engaged in conversation to de-key their radios before the announcement group call can begin. Others in the group will get a busy signal if they try to make a call after an announcement group call has been initiated but has not yet been granted a channel. Calls initiated during this period will not be placed in a queue and must be reinitiated after the announcement group call has ended. Those involved in telephone interconnect calls are not affected by an announcement group call. Once they complete their telephone call, they will automatically join the announcement group call.

The other set up for this type of call enables an interrupt type of call. When a user initiates a Multi-group call, their call will immediately interrupt other conversations in progress without waiting for other users to de-key. However, those radio users who are transmitting on a voice channel will not hear the announcement group call until they de-key. They will then join the announcement group call if it is still in progress. Everyone in an announcement group call is Message Trunked, meaning all subscribers are able to respond to the announcement on the same voice channel.

TEST INSTRUCTIONS

1. Program Talkgroup A and Talkgroup B to the same announcement call group and Talkgroup C to a different announcement call group.

2. Initiate the announcement call from a Talkgroup A radio.

3. Observe that only Talkgroup A and B will receive the announcement call.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SIMULCAST TRUNKING SYSTEM

SMARTNET FEATURES

MULTIPLE PRIORITY LEVELS

DESCRIPTION

In addition to giving priority to recent users, Motorola Trunked systems provide multiple levels of priority to allow system access to the most critical users during busy periods. Users and groups may be assigned a particular priority level. In the event of a busy, channel requests are processed according to priority on first come first served basis. The system manager via a System Manager Terminal (SMT) or through SIMS can control assignment of priority levels if equipped with the proper software option.

There are eight levels of priority on SMARTNET II system. An emergency call will always take the highest priority on a SMARTNET system.

TEST INSTRUCTIONS

1. Program the radios in Talkgroup C with priority level 7 and program the radios in Talkgroup A and B with priority level 8.

2. Disable all but one voice channel.

3. Key a radio from Talkgroup A and hold the PTT key.

4. Key a radio from Talkgroup B then key a radio from Talkgroup C.

5. Release the PTT key from the Talkgroup "A" radio Talkgroup C should receive a callback tone.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SIMULCAST TRUNKING SYSTEM

SMARTNET FEATURES

BACKUP CONTROL CHANNELS

DESCRIPTION

Any one of the first four channels on a Trunked radio system is eligible for assignment as a control channel. Control channel assignment rotates among these channels on a daily basis. In the event that the control channel fails, the central controller automatically assigns one of the other eligible channels as the active control channel.

TEST INSTRUCTIONS

1. Force channel 1 to be the current control channel.
2. Disable channel one on the front panel of the central controller.
3. Now the central controller should indicate that channel two is the current control channel.
4. Repeat step 2 for channels two and three.
5. By this time, the central controller should indicate that channel four is the current control channel

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SIMULCAST TRUNKING SYSTEM

SMARTNET FEATURES

FAILSOFT OPERATION

DESCRIPTION

The Trunked system will go into the "Failsoft mode" in the event of a major alarm on the central controller. When in this mode, radios will operate as they would on a conventional repeater system. Radio users are made aware that the system has gone into Failsoft by the automatic sounding of a low level, audible alert tone every ten seconds.

TEST INSTRUCTIONS

1. Set three pairs of subscriber units to Talkgroups A, B, and C.

2. Disable the central controller to force the Trunked system into Failsoft.

3. Give a test count on subscriber unit A_1 and verify that only subscriber unit A2 receives the test count.

4. Repeat step 3 for Talkgroups B and C.

Pass Y N Punch list Item # _____

Comments: _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SIMULCAST TRUNKING SYSTEM

SMARTNET FEATURES

QUANTAR BASE STATION FAILURE

DESCRIPTION

To show how the Central Controller disables a channel system wide when a failure occurs in a single base station at a single site.

TEST INSTRUCTIONS

1. Disconnecting the external reference oscillator input can simulate a base station failure.

2. Once the reference is removed the station's transmit and receive synthesizers loose lock and the station can neither transmit nor receive.

3. This channel is assigned on a call request the QUANTAR or MSF5000 will fail TSTAT.

4. When the prime controller detects failed TSTAT from any station at any one site the controller disables the channel from the entire system.

5. The channel will remain disabled till the external oscillator input is re-connected to the station input.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SIMULCAST TRUNKING SYSTEM

SMARTNET FEATURES

TRANSMITTER POWER FAILURE SHUTDOWN

DESCRIPTION

The central controller can detect a loss or decrease in transmitter output power. If the output of one of the repeaters drops below a threshold level, half-rated power, the central controller will not assign that repeater and will send an error message to the System Manager Terminal (SMT). The central controller can also detect high reverse power.

TEST INSTRUCTIONS

1. Reduce the transmitter output power of any repeater station until the central controller shuts down the repeater.

2. Observe that the front panel of the central controller will indicate that the repeater is being disabled.

3. Restore power output to proper level, note that the repeater is restored to service

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SIMULCAST TRUNKING SYSTEM

REDUNDANT CONTROLLER SWITCHING

AUTOMATIC TRUNKING PRIME CONTROLLER A/B SWITCHING

DESCRIPTION

This determines the ability of the console CEB to detect a major fault in the active central controller and cause the T-BAR to switch central controllers.

SPECIFICATION

If the system enters a state where the main central controller cannot remain Trunked, the CEB sensing the problem sends a switch command to the T-BAR thereby activating the backup central controller.

TEST INSTRUCTIONS

1. Disable the control channels on the main central controller.
2. Verify that the T-BAR switches to the backup controller.
3. Disable the control channels on the backup central controller.
4. Verify that the system goes into Failsoft.
5. Enable the control channels on the main central controller.
6. Clear the Trunking history at the active System Manager Workstation or the supervisor console.
7. Verify that the T-BAR switches back to the main central controller.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SIMULCAST TRUNKING SYSTEM

REDUNDANT CONTROLLER SWITCHING

MANUAL PRIME CENTRAL CONTROLLER A/B SWITCHING

MANUAL CENTRAL CONTROLLER SWITCHING

DESCRIPTION

To ensure continued communication, SmartZone sub-systems with a redundant Central Controller can restore the Main Central Site Controller as the active unit from the supervisor's console after a fault has been cleared.

SETUP

The system is operational and the Alternate Central Site Controller as the active unit.

TEST INSTRUCTIONS.

1. Verify that the SmartZone site is in Wide Trunking mode.
2. Clear the Main Central Site Controller's Trunking history from the Supervisors console position.
3. From the supervisor position, depress the CENTRAL SAFETY SWITCH and the CONTROLLER A B SWITCH.
4. System will idle for 15-20 seconds while the Main Central Site Controller activates.
5. Verify that the Main Central Site Controllers is now active.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SIMULCAST TRUNKING SYSTEM

QUANTAR DIGITAL TRUNKED REPEATER

INTRODUCTION

The purpose of this procedure is to provide the details required in perform the test to ensure that the SMARTNET TRUNKING SYSTEM meets the required standards.

The data sheets provided are to be completed and provided to the system operator as the acceptance test report.

SIMULCAST TRUNKING SYSTEM

ASTROTAC 3000 MIXED MODE COMPARATOR

VOTING TEST

DESCRIPTION

This test will demonstrate the comparator's voting ability. Two users on opposite ends of the city shall may be required.

TEST INSTRUCTIONS

1. Steer the test TG to a given resource.
2. North end user will state location (relatively open area) give a long test count in the digital mode, and monitor the audio sent to the console.
3. Note the site that is voted and then disable that site on the comparator. The site that voted should be but not necessarily nearest the user location.
4. Continue disabling the voted site and noting the progression. The reception should remain the same or get progressively worse.
5. Restore comparator and repeat test the south end user.
6. Restore comparator and repeat test on the next resource until complete.
7. Return comparator to its normal configuration.

Note: The predictability of a given site voting in Miami Beach due to the heavy building clutter is not consistent, however the audio quality should start high and then degrade as the voted receivers are disabled.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SIMULCAST TRUNKING SYSTEM

QUANTAR DIGITAL TRUNKED REPEATER

ANTENNA/LINE VSWR

DESCRIPTION

Both receive and transmit antenna systems will have their VSWR measured. VSWR plots taken during installation may be submitted in place of this test.

SPECIFICATION

Reflected power not to exceed 1.5 VSWR

TEST INSTRUCTIONS

8. Transmit Antenna and Lines

9. Disconnect transmit antenna feed line from combiner output.

10. Connect Hewlett Packard Network Analyzer (Model # 8753C or equivalent) output to antenna feed line.

11. Measure VSWR for line and antenna combination and print the results.

12. Return line to its normal configuration.

13. Rx Antenna and Lines

14. Disconnect receive antenna feed line from multi-coupler input.

15. Connect Hewlett Packard Network Analyzer output to antenna feed line.

16. Measure VSWR for line and antenna combination and print the results.

17. Return line to its normal configuration.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SIMULCAST TRUNKING SYSTEM

QUANTAR DIGITAL TRUNKED REPEATER

REPEATER POWER OUTPUT

Each Trunked repeater station will have its power output measured at the output of the repeater, the input to the combiner, and the output of the combiner.

SPECIFICATION:

Power set at rated power out, combiner loss not to exceed combiner loss specification.

TEST INSTRUCTIONS

1. Connect a directional wattmeter, X, at the output of the station and terminated into a RF load.

2. Key the station and set the station power output to +50dBm, 100W.

3. Enter the results in dB on the transmit combiner test sheet and de-key the station. This is the "Station Output Forward" reading.

4. Add a second directional wattmeter, Y, in series after the first wattmeter, X, with barrel adapter.

5. Key the station and note the reading of the wattmeter in dBm.

6. Record the difference in dB between the two meters on the transmit combiner test sheet and de-key the station. This is the "Wattmeter Difference" reading.

7. Repeat step one for each station and normal the connections to the combiner.

8. Connect the first directional wattmeter, X, at the input to the combiner and the second directional wattmeter, Y, on the output of the combiner.

9. Key the station and note the forward and reflected power readings in dBm of both wattcmeters.

10. Record each reading in dB on the transmit combiner test sheet and de-key the station. These are the "Combiner Input Reflected, X; Combiner Output Reflected, Y; Combiner Input Forward, X; Combiner Output Forward, Y" readings.

11. Repeat step four on the remaining stations.

12. Calculate the loss of the combiner, Input – Output + Difference = Loss, and record on the transmitter test sheet.

13. This is the "Combiner Loss" result. Compare calculated loss to the combiner specifications

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

RESERVOIR SITE, TRANSMIT COMBINER TEST SHEET

Chan.	Station Output Forward	Combiner Input Reflected, X	Combiner Output Reflected, Y	Combiner Input Forward, X	Combiner Output Forward, Y	Wattmeter Difference	Combiner Losses
1	dBm	dBm	dBm	dBm	dBm	dB	dB
2	dBm	dBm	dBm	dBm	dBm	dB	dB
3	dBm	dBm	dBm	dBm	dBm	dB	dB
4	dBm	dBm	dBm	dBm	dBm	dB	dB
5	dBm	dBm	dBm	dBm	dBm	dB	dB
6	dBm	dBm	dBm	dBm	dBm	dB	dB
7	dBm	dBm	dBm	dBm	dBm	dB	dB
8	dBm	dBm	dBm	dBm	dBm	dB	dB
9	dBm	dBm	dBm	dBm	dBm	dB	dB
10	dBm	dBm	dBm	dBm	dBm	dB	dB

Design, engineering and pricing information contained in this offering is considered confidential, proprietary and trade secret and may not be shared with any person or agency not directly associated with the addressee without the express written consent of Motorola, Inc., or its designees.

TOWER 41 SITE, TRANSMIT COMBINER TEST SHEET

Chan.	Station Output Forward	Combiner Input Reflected, X	Combiner Output Reflected, Y	Combiner Input Forward, X	Combiner Output Forward, Y	Wattmeter Difference	Combiner Losses
1	dBm	dBm	dBm	dBm	dBm	dB	dB
2	dBm	dBm	dBm	dBm	dBm	dB	dB
3	dBm	dBm	dBm	dBm	dBm	dB	dB
4	dBm	dBm	dBm	dBm	dBm	dB	dB
5	dBm	dBm	dBm	dBm	dBm	dB	dB
6	dBm	dBm	dBm	dBm	dBm	dB	dB
7	dBm	dBm	dBm	dBm	dBm	dB	dB
8	dBm	dBm	dBm	dBm	dBm	dB	dB
9	dBm	dBm	dBm	dBm	dBm	dB	dB
10	dBm	dBm	dBm	dBm	dBm	dB	dB

Design, engineering and pricing information contained in this offering is considered confidential, proprietary and trade secret and may not be shared with any person or agency not directly associated with the addressee without the express written consent of Motorola, Inc., or its designees.

FIRE STATION 2 SITE, TRANSMIT COMBINER TEST SHEET

Chan.	Station Output Forward	Combiner Input Reflected, X	Combiner Output Reflected, Y	Combiner Input Forward, X	Combiner Output Forward, Y	Wattmeter Difference	Combiner Losses
1	dBm	dBm	dBm	dBm	dBm	dB	dB
2	dBm	dBm	dBm	dBm	dBm	dB	dB
3	dBm	dBm	dBm	dBm	dBm	dB	dB
4	dBm	dBm	dBm	dBm	dBm	dB	dB
5	dBm	dBm	dBm	dBm	dBm	dB	dB
6	dBm	dBm	dBm	dBm	dBm	dB	dB
7	dBm	dBm	dBm	dBm	dBm	dB	dB
8	dBm	dBm	dBm	dBm	dBm	dB	dB
9	dBm	dBm	dBm	dBm	dBm	dB	dB
10	dBm	dBm	dBm	dBm	dBm	dB	dB

Design, engineering and pricing information contained in this offering is considered confidential, proprietary and trade secret and may not be shared with any person or agency not directly associated with the addressee without the express written consent of Motorola, Inc., or its designees.

Transmitter Test Sheets

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SIMULCAST TRUNKING SYSTEM

QUANTAR DIGITAL TRUNKED REPEATER

TRANSMIT FREQUENCY INSTANTIOUS DEVIATION

Each repeater will have its frequency and deviation measured in Trunked and Failsoft operation.

SPECIFICATION:

Analog Deviation in Trunked and Failsoft operation: +- 3.3 KHz +-0.1 KHz

Digital Deviation in Trunked operation: +-3.6KHz +-0.1 KHz

TEST INSTRUCTIONS

1. Place the station into Failsoft by disconnecting the control cable from the repeater.

2. The repeater's transmit frequency must be within 50 Hz of assigned frequency to insure the VCO is locked to the external frequency standard.

3. The OSW (Outbound Signaling Word) must be +-0.8 KHz, +-0.1 KHz.

4. Apply an on frequency, FM carrier, modulated by a 1KHz tone, deviated at 3.3KHz, into the receiver. The transmit deviation must be 4.1 KHz, +-0.1 KHz.

5. Send an Alert 1 tone from a console operator position, 1200 Hz tone at -10dBm into the transmitter-input line. The deviation must be 4.1 KHz, +-0.1 KHz.

6. Place the repeater into the Trunked mode by re-connecting the control cable. Key the station with a Local PTT on the DMP. Check the maximum trunk deviation for 5.0 KHz +-0.1 KHz.

7. Restore the station for normal operation.

8. Engage the repeater in a digital voice call and check the digital deviation for +-3.6KHz +-0.1 KHz

9. Repeat test for all repeaters.

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SIMULCAST TRUNKING SYSTEM

QUANTAR DIGITAL TRUNKED REPEATER

RECEIVER SENSITIVITY

Each receiver will have its absolute and effective sensitivity measured. Additionally, the receiver sensitivity will be bench marked using the TMP Test Port.

Note: These tests are to be performed after the tower mounted preamplifier-multicoupler systems have been optimized per manufacturers recommendations. Typically this requires installation and/or adjustment of fixed or variable attenuators in order to optimize the IM performance of the TMP system without impairing TMP system noise figure.

SPECIFICATION:

12dB SINAD with -117dbm (0.3uV) of signal or less

TEST INSTRUCTIONS

1. Connect a RF generator, set to the channel's frequency, to the Repeater receiver input port and connect the receiver output to the SINAD meter input.

2. Check the receiver for a 12 dB SINAD sensitivity of -117dbm (0.3uV) or better and record the results on the "12 dB SINAD Absolute Receiver Sensitivity Test Sheet."

3. Note the RF level required to obtain a 20db SINAD and enter the results on the "Receiver Effective Sensitivity Test Sheet." This is the "Absolute Receiver Sensitivity" reading.

4. Connect an insolated TEE at the station receiver port terminated into a RF load.

5. Connect a RF signal generator to the isolated port.

6. Note the RF level required to obtain a 20db SINAD and enter the results on the "Receiver Effective Sensitivity Test Sheet." This relative reading will be dependent on the loss of the isolation TEE. This is the "Rx Sensitivity, Isolation Tee at Station terminated to a local RF load" reading.

7. Remove the RF load and connect the insolated TEE to the normal Multicoupler port.

8. Switch the TMP into the TMP RF load. Note the RF level required to obtain a 20db SINAD and enter the results on the "Receiver Effective Sensitivity Test Sheet." The reading will be dependent on the loss of the isolation TEE and the noise from the antenna

TMP/Multicoupler network. This is the "Rx Sensitivity, Isolation Tee at Station terminated to Multicoupler port, TMP RF load engaged" reading.

9. Enter the difference in dB of the "Rx Sensitivity, Isolation Tee at Station terminated to a local RF load" and the "Rx Sensitivity, Isolation Tee at Station terminated to Multicoupler port, TMP RF load engaged" readings in the indicated space.

10. Switch the TMP into the Antenna. Note the RF level required to obtain a 20db SINAD and enter the results on the "Receiver Effective Sensitivity Test Sheet." The reading will be dependent on the loss of the isolation TEE, the noise from the antenna TMP/Multicoupler network, and external noise sources. This is the "Rx Sensitivity, Isolation Tee at Station terminated Multicoupler port, antenna engaged" reading.

11. Enter the difference in dB of the "Rx Sensitivity, Isolation Tee at Station terminated to a local RF load" and the "Rx Sensitivity, Isolation Tee at Station terminated to Multicoupler port, antenna engaged" readings in the indicated space.

12. Repeat for remaining receivers.

13. Restore all normal receiver RF terminations to the Multicoupler ports.

14. Connect the signal generator to the TMP Test Port and engage the TMP RF load. Note the RF level required to obtain a 20dB SINAD reading on each receiver and enter the results on the "Receiver TMP/Multicoupler Effective Sensitivity Test Sheet." This is the "Receiver Sensitivity using TMP Test Port, TMP RF load engaged" reading.

15. Engage the antenna to the TMP and note the RF level required to obtain a 20dB SINAD reading on each receiver and enter the results on "Receiver TMP/Multicoupler Effective Sensitivity Test Sheet." This is the "Receiver Sensitivity using TMP Test Port, Antenna engaged" reading.

16. Calculate the difference between the receiver sensitivity reading with TMP RF load engaged and the receiver sensitivity with the antenna engaged. This is the site receiver degradation figure. Ideally it should be 0.0dB. Readings other than 0.0dB generally indicate an outside source of interference and shall not be viewed as an equipment fault or a failing of this section of the ATP. Motorola will make a reasonable effort to locate and resolve degradation or present a plan to resolve or minimize the source of the interference.

ALL SITES, 12 DB SINAD ABSOLUTE RECEIVER SENSITIVITY TEST SHEET

Channel	Reservoir Site	Tower 41 Site	Fire Station 2 Site	Rebecca Towers
1	dBm	dBm	dBm	dBm
2	dBm	dBm	dBm	dBm
3	dBm	dBm	dBm	dBm
4	dBm	dBm	dBm	dBm
5	dBm	dBm	dBm	dBm
6	dBm	dBm	dBm	dBm
7	dBm	dBm	dBm	dBm
8	dBm	dBm	dBm	dBm
9	dBm	dBm	dBm	dBm
10	dBm	dBm	dBm	dBm

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RESERVOIR SITE, RECEIVER EFFECTIVE SENSITIVITY TEST SHEET

Channel	Absolute Rx Sensitivity	Rx Sensitivity, Isolation Tee at Station terminated to a local RF load	Rx Sensitivity, Isolation Tee at Station terminated to Multicoupler port, TMP RF load engaged	Multicoupler Int. Noise Degradation: Local RF load verses Multicoupler port, TMP RF load engaged	Rx Sensitivity, Isolation Tee at Station terminated to Multicoupler port, antenna engaged	Multicoupler Ext. Noise Degradation: Local RF load verses Multicoupler port, antenna engaged
1	dBm	dBm	dBm	dB	dBm	dB
2	dBm	dBm	dBm	dB	dBm	dB
3	dBm	dBm	dBm	dB	dBm	dB
4	dBm	dBm	dBm	dB	dBm	dB
5	dBm	dBm	dBm	dB	dBm	dB
6	dBm	dBm	dBm	dB	dBm	dB
7	dBm	dBm	dBm	dB	dBm	dB
8	dBm	dBm	dBm	dB	dBm	dB
9	dBm	dBm	dBm	dB	dBm	dB
10	dBm	dBm	dBm	dB	dBm	dB

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RESERVOIR SITE, RECEIVER TMP/MULTICOUPLER EFFECTIVE SENSITIVITY TEST SHEET

Channel	Receiver Sensitivity using TMP Test Port, TMP RF load engaged	Receiver Sensitivity using TMP Test Port, Antenna engaged	External Noise Degradation
1	dBm	dBm	dB
2	dBm	dBm	dB
3	dBm	dBm	dB
4	dBm	dBm	dB
5	dBm	dBm	dB
6	dBm	dBm	dB
7	dBm	dBm	dB
8	dBm	dBm	dB
9	dBm	dBm	dB
10	dBm	dBm	dB

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TOWER 41 SITE, RECEIVER EFFECTIVE SENSITIVITY TEST SHEET

Channel	Absolute Rx Sensitivity	Rx Sensitivity, Isolation Tee at Station terminated to a local RF load	Rx Sensitivity, Isolation Tee at Station terminated to Multicoupler port, TMP RF load engaged	Multicoupler Int. Noise Degradation: Local RF load verses Multicoupler port, TMP RF load engaged	Rx Sensitivity, Isolation Tee at Station terminated to Multicoupler port, antenna engaged	Multicoupler Ext. Noise Degradation: Local RF load verses Multicoupler port, antenna engaged
1	dBm	dBm	dBm	dB	dBm	dB
2	dBm	dBm	dBm	dB	dBm	dB
3	dBm	dBm	dBm	dB	dBm	dB
4	dBm	dBm	dBm	dB	dBm	dB
5	dBm	dBm	dBm	dB	dBm	dB
6	dBm	dBm	dBm	dB	dBm	dB
7	dBm	dBm	dBm	dB	dBm	dB
8	dBm	dBm	dBm	dB	dBm	dB
9	dBm	dBm	dBm	dB	dBm	dB
10	dBm	dBm	dBm	dB	dBm	dB

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TOWER 41 SITE, RECEIVER TMP/MULTICOUPLER EFFECTIVE SENSITIVITY TEST SHEET

Channel	Receiver Sensitivity using TMP Test Port RF load engaged	Receiver Sensitivity using TMP Test Port Antenna engaged	External Noise Degradation
1	dBm	dBm	dB
2	dBm	dBm	dB
3	dBm	dBm	dB
4	dBm	dBm	dB
5	dBm	dBm	dB
6	dBm	dBm	dB
7	dBm	dBm	dB
8	dBm	dBm	dB
9	dBm	dBm	dB
10	dBm	dBm	dB

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FIRE STATION 2 SITE, RECEIVER EFFECTIVE SENSITIVITY TEST SHEET

Channel	Absolute Rx Sensitivity	Rx Sensitivity, Isolation Tee at Station terminated to a local RF load	Rx Sensitivity, Isolation Tee at Station terminated to Multicoupler port, TMP RF load engaged	Multicoupler Int. Noise Degradation: Local RF load verses Multicoupler port, TMP RF load engaged	Rx Sensitivity, Isolation Tee at Station terminated to Multicoupler port, antenna engaged	Multicoupler Ext. Noise Degradation: Local RF load verses Multicoupler port, antenna engaged
1	dBm	dBm	dBm	dB	dBm	dB
2	dBm	dBm	dBm	dB	dBm	dB
3	dBm	dBm	dBm	dB	dBm	dB
4	dBm	dBm	dBm	dB	dBm	dB
5	dBm	dBm	dBm	dB	dBm	dB
6	dBm	dBm	dBm	dB	dBm	dB
7	dBm	dBm	dBm	dB	dBm	dB
8	dBm	dBm	dBm	dB	dBm	dB
9	dBm	dBm	dBm	dB	dBm	dB
10	dBm	dBm	dBm	dB	dBm	dB

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FIRE STATION 2 SITE, RECEIVER TMP/MULTICOUPLER EFFECTIVE SENSITIVITY TEST SHEET

Channel	Receiver Sensitivity using TMP Test Port, TMP RF load engaged	Receiver Sensitivity using TMP Test Port, Antenna engaged	External Noise Degradation
1	dBm	dBm	dB
2	dBm	dBm	dB
3	dBm	dBm	dB
4	dBm	dBm	dB
5	dBm	dBm	dB
6	dBm	dBm	dB
7	dBm	dBm	dB
8	dBm	dBm	dB
9	dBm	dBm	dB
10	dBm	dBm	dB

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REBECCA TOWER SITE, RECEIVER EFFECTIVE SENSITIVITY TEST SHEET

Channel	Absolute Rx Sensitivity	Rx Sensitivity, Isolation Tee at Station terminated to a local RF load	Rx Sensitivity, Isolation Tee at Station terminated to Multicoupler port, TMP RF load engaged	Multicoupler Int. Noise Degradation: Local RF load verses Multicoupler port, TMP RF load engaged	Rx Sensitivity, Isolation Tee at Station terminated to Multicoupler port, antenna engaged	Multicoupler Ext. Noise Degradation: Local RF load verses Multicoupler port, antenna engaged
1	dBm	dBm	dBm	dB	dBm	dB
2	dBm	dBm	dBm	dB	dBm	dB
3	dBm	dBm	dBm	dB	dBm	dB
4	dBm	dBm	dBm	dB	dBm	dB
5	dBm	dBm	dBm	dB	dBm	dB
6	dBm	dBm	dBm	dB	dBm	dB
7	dBm	dBm	dBm	dB	dBm	dB
8	dBm	dBm	dBm	dB	dBm	dB
9	dBm	dBm	dBm	dB	dBm	dB
10	dBm	dBm	dBm	dB	dBm	dB

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REBECCA TOWER SITE, RECEIVER TMP/MULTICOUPLER EFFECTIVE SENSITIVITY TEST SHEET

Channel	Receiver Sensitivity using TMP Test Port TMP with RF load engaged	Receiver Sensitivity using TMP Test Port with Antenna engaged	External Noise Degradation
1	dBm	dBm	dB
2	dBm	dBm	dB
3	dBm	dBm	dB
4	dBm	dBm	dB
5	dBm	dBm	dB
6	dBm	dBm	dB
7	dBm	dBm	dB
8	dBm	dBm	dB
9	dBm	dBm	dB
10	dBm	dBm	dB

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Receiver Test Sheets

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

CENTRACOM GOLD ELITE CONSOLE

OPERATOR POSITION FUNCTIONS

INTRODUCTION

To insure that all equipment is functional requires that detailed test scenarios be executed and the results tabulated. The results of these tests will become part of the final system documentation to be delivered upon project completion.

Factory acceptance tests are those functional tests performed on new equipment delivered from Motorola's factories.

All acceptance tests will be conducted by Motorola personnel and witnessed by at least one (1) representative of the City of Miami Beach. Motorola may request the assistance of customer personnel for some tests.

As all console operator positions are identical, City of Miami Beach may elect to perform these acceptance tests on a sampling of the available consoles. Tests, which have passed on the sampled consoles, will be considered to have passed and accepted for all consoles.

The failure of a test shall not require the re-running of the entire Factory Acceptance Test. Any failures noted will be entered on a "Punch List". Motorola will re-run any failed test following resolution of the problem.

CENTRACOM GOLD ELITE CONSOLE
OPERATOR POSITION FUNCTIONS

MOUSE OPERATION

DESCRIPTION:

This test will check the functionality of the Mouse used to select items on the screen.

TEST:

1. Using the mouse, position the cursor and depress the icon to select a channel or activity function.

2. Selected channel or activity will be highlighted.

Circle operator positions tested. 1 2 3 4 5 6 7 8

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

CENTRACOM GOLD ELITE CONSOLE
OPERATOR POSITION FUNCTIONS

FOOT SWITCH OPERATION

DESCRIPTION:

This test will check the functionality of the Foot Switch used to select items on the screen.

TEST:

1. Using the Mouse, position the cursor on the screen and depress on channel window to select a channel. Selected channel will become highlighted.

2. Depressing the Foot switch on the floor allows a user to transmit on the channel, which is selected.

Circle operator positions tested. 1 2 3 4 5 6 7 8

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

CENTRACOM GOLD ELITE CONSOLE
OPERATOR POSITION FUNCTIONS

MONITORING CALLS

DESCRIPTION:

The purpose of this section is to verify that the CRT console position under test and associated hardware in the CEB is in good working order.

TEST:

1. Verify that the console under test will receive calls from the test radio.

2. Verify that the Call Indicator flashes whenever audio is present on the associated channel. On channels with signaling verify that the ID is displayed if the call is initiated by a signaling equipped radio.

3. Verify that the selected channel audio passes through the select speaker, and when the channel is not selected that the audio passes through the unselect speaker.

Circle operator positions tested. 1 2 3 4 5 6 7 8

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

CENTRACOM GOLD ELITE CONSOLE
OPERATOR POSITION FUNCTIONS

DISPATCHING CALLS FROM CRT CONSOLES

DESCRIPTION:

The purpose of this test is to verify that the CRT console under test can dispatch calls to different channels in the system.

TEST:

1. Select a channel on the CRT console under test. Initiate a transmission and verify that the test radio can receive the dispatch on that channel.

2. Verify that the "XMIT" symbol (a red lightning bolt) appears in each channel window during channel dispatch.

3. Verify other console positions indicate that the selected channel is busy.

Circle operator positions tested. 1 2 3 4 5 6 7 8

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

CENTRACOM GOLD ELITE CONSOLE
OPERATOR POSITION FUNCTIONS

CONSOLE PRIORITY INTERFACE

DESCRIPTION:

The purpose of this test is to verify that the console under test has transmit priority over radio communication.

TEST:

1. Using two radios, initiate a call with a test radios and verify the other test radio and console can receive the call.

2. Verify that when the console transmits on the same channel. The console audio overrides the repeated test radio audio.

Circle operator positions tested. 1 2 3 4 5 6 7 8

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

CENTRACOM GOLD ELITE CONSOLE
OPERATOR POSITION FUNCTIONS

LINE OPERATED BUSY LIGHT

DESCRIPTION:

The Line Operated Busy Light (LOBL) provides a visual indication of channel activity. The character shown is a yellow transmit symbol and is displayed on all CRTs in the system.

TEST:

1. Invoke a channel PTT on a selected operator position.

2. Observe the remaining operator positions and verify that the yellow transmit symbol is in the respective channel window.

Circle operator positions tested. 1 2 3 4 5 6 7 8

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

CENTRACOM GOLD ELITE CONSOLE
OPERATOR POSITION FUNCTIONS

LOGGING RECORDER INTERFACE TEST

DESCRIPTION:

The purpose of this test is to verify that Transmit and Receive audio specified by the customer is available for logging. Use the system map to identify the channels or Talkgroups to be logged.

TEST:

1. Connect a transmission test set to the channel under test or monitor the channel from the logging recorder.

2. Verify that Transmit and Receive audio is present.

Circle operator positions tested. 1 2 3 4 5 6 7 8

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

CENTRACOM GOLD ELITE CONSOLE
OPERATOR POSITION FUNCTIONS

ALERT TONES

DESCRIPTION:

The console operator is provided with three Alert Tones, continuous 1.2KHz tone, two alternating tones, interrupted 1 KHz tone. Alert Tones can be heard at all console positions and all radios on the channel. There are three alert tones: The Alert Tones may be found in the Toolbar Menu and shows the currently selected tone.

TEST:

1. Select the desired radio channel by clicking on the channel window.

2. Using the Mouse or touch screen, go to the Toolbar and select the Alert Tone to be tested.

3. Return to the Alert Tone icon and depress the Transmit area of the icon. The Alert Tone is 6 sec in duration (max.).

4. Repeat from step 2 for the other Alert Tone sounds.

Circle operator positions tested. 1 2 3 4 5 6 7 8

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

CENTRACOM GOLD ELITE CONSOLE
OPERATOR POSITION FUNCTIONS

MULTISELECT TRANSMIT

DESCRIPTION:

The Multiselect (MSEL) feature allows more than one channel to be selected simultaneously. The console operator can talk and listen to all the selected channels, however, the members on a channel cannot talk or listen to other members of other channels, only members within their channel.

SETUP:

Select a MSEL folder and verify that MSEL becomes highlighted. Click on the MSEL icon to open the MSEL folder. Select two or more channels by clicking on the desired channel windows. The channel names will appear in the MSEL folder. Close the MSEL folder. Set test radio 1 to test channel 1 and set test radio 2 to test channel 2.

TEST:

1. From the console, transmit using the test channel 1 icon. The transmission should be received by test radio 1 only.

2. From the console, transmit using the test channel 2 icon. The transmission should be received by test radio 2 only.

3. From the console, transmit using the MSEL transmit icon. The transmission should be received by both radios.

4. Select the MSEL window by clicking on the MSEL icon.

5. Deselect the MSEL channels by clicking on the appropriate channel window.

6. Close the MSEL window by clicking on the MSEL icon.

Circle operator positions tested. 1 2 3 4 5 6 7 8

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

CENTRACOM GOLD ELITE CONSOLE
OPERATOR POSITION FUNCTIONS

PATCH TEST

DESCRIPTION:

The purpose of this test is to verify that two or more channels can be patched together and will communicate between the channels.

SETUP:

Select the Patch 1 folder and verify that Patch 1 becomes highlighted.

Click on the Patch icon to open the patch folder.

Select two or more channels by clicking on the desired channels. The channel names will appear in the patch folder. The patch number will appear in the channel window. This indicates that the channels are now a part of Patch 1.

Close the patch folder.

Set test radio 1 to test channel 1 and set test radio 2 to test channel 2.

TEST:

1. From the console, transmit using the test channel 1 icon. The transmission should be received by test radio 1 only..

2. From the console, transmit using the test channel 2 icon. The transmission should be received by test radio 2 only.

3. From the console, transmit using the patch transmit icon. The transmission should be received by both radios..

4. Verify that transmissions from either test radio are received by the other.

5. Select the Patch window by clicking on the patch icon.

6. Deselect the Patch channels by clicking on the appropriate channel window to dissolve the Patch.

7. Close the Patch window by clicking on the patch icon.

Circle operator positions tested. 1 2 3 4 5 6 7 8

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

CENTRACOM GOLD ELITE CONSOLE
OPERATOR POSITION FUNCTIONS

ALL MUTE

DESCRIPTION:

The icon "All Mute" mutes all unselected channels.

Depressing the "All Mute" from the Feature Menu completely mutes the volume of the unselect speaker. The previous volume level may be reset at any time by depressing "All Mute" a second time.

TEST:

Initiate a call from a subscriber unit on a channel that is not currently selected at the console.

Depress the ALL MUTE switch located on the Feature Menu or tool bar.

Verify that the audio volume is muted.

Verify that the audio level returns to its previous level upon time out (30 seconds) or by depressing the ALL MUTE switch a second time.

Circle operator positions tested. 1 2 3 4 5 6 7 8

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

CENTRACOM GOLD ELITE CONSOLE
OPERATOR POSITION FUNCTIONS

SELECTIVE INTERCOM

DESCRIPTION:

The Intercom Call feature allows Intercom operation between dispatch operators. It is accessed via the Feature Menu or icon and provides the ability for an operator to speak with a single operator or all operators.

TEST:

1. Access the Intercom Call from the features list.
2. Within the "Send To" Box select the Alias of the desired dispatch position.
3. Using the Mouse (left button) or via Touch Screen click on Send. An Audio Alert Tone will be transmitted six (6) times at both operator positions. (After the sixth transmission, the operator is required to send the request again.)
4. The person receiving must access the Intercom Call window from the Features List or icon, and click on the Answer button. This position will then have an open microphone.
5. The sending position then depresses the "Transmit Button" and begins conversation.
6. Upon completion, either operator may click on the Hang-up icon.
7. Repeat test selecting type: all Ops
8. Click on the Close icon to close the intercom call window.

Circle operator positions tested. 1 2 3 4 5 6 7 8

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

CENTRACOM GOLD ELITE CONSOLE
OPERATOR POSITION FUNCTIONS

16 I/O TEST

DESCRIPTION:

The 16 I/O board allows up to 16 I/O circuits if present.

TEST:

1. Select a closure icon.
2. Using the Mouse or via the Touch Screen Display change the state of the closure.
3. Verify relay activation.

Circle operator positions tested. 1 2 3 4 5 6 7 8

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

CENTRACOM GOLD ELITE CONSOLE
OPERATOR POSITION FUNCTIONS

EMERGENCY CALL

DESCRIPTION.

Users in life threatening situations can use the emergency button on the radio to send an audible and visual alarm signal to a console operator in order to request immediate system access to a voice channel for an emergency call. The emergency alarm is displayed at console operator positions as well as at the SmartZone Dispatcher. An emergency alarm begins after the radio user presses the radio's emergency button. Pressing the emergency button places the radio in "emergency mode". To begin an emergency call, the radio user must press the radio's PTT button while in "emergency mode." The assigned voice channel will be dedicated to the emergency caller's Talkgroup for an extended period of time, equal to the Message Hang Time plus the Emergency Hang Time.

2. TEST INSTRUCTIONS.

1. Select Talkgroup A (TG A) on radios 1 and 2.

2. Press the emergency button on Radio 1. The emergency alarm and the unit ID/alias of radio 1 is displayed at the console position monitoring the TG A resource.

3. Disable the emergency tone at the console position to prepare for incoming audio from radio 1.

4. Press the PTT on radio 1 to begin the emergency call in TG A.

5. Both the console operator position and radio 2 hear the audio from radio 1 which is in emergency mode.

6. At the console operator position respond to radio 1 by selecting and transmitting on the TG A resource.

7. After completing the emergency call, press and hold the emergency button on radio 1 until an alert tone sounds. Knockdown the emergency at the console position.

8. The alert tone from radio 1 signifies that the user has removed the radio from emergency mode."

Circle operator positions tested. 1 2 3 4 5 6 7 8

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

CENTRACOM GOLD ELITE CONSOLE
OPERATOR POSITION FUNCTIONS

OPERATOR POSITION CONFIGURATION

DESCRIPTION.

Check the operator position programming for correctness against the system map.

TEST INSTRUCTIONS.

1. Select an operator position and verify the programming against the system map.

Circle operator positions tested. 1 2 3 4 5 6 7 8

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SUBSCRIBERS

NEW UNITS HARDWARE VERIFICATION

ASTRO SPECTRA DESKTOP

DESCRIPTION

Check the subscriber for performance. Verify VSWR range and VSWR frequency plots are nominal. Note: A network analyzer will be used in instead of a TDR.

TEST INSTRUCTIONS

Check the following on the subject station

- Installation and Remote Operation (No Local Operation) _____
- Frequency Reference Error _____HZ
- Transmitter Power, Forward / Reflected _____W
- Transmitter Analog/Digital Deviation _____KHz
- Receiver 12dB SINAD _____dBM
- Squelch Setting dBM

Circle templates tested. 1 2 3 4 5 6 7 8 9
10 11 12

Pass Y N Punch list Item #

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SUBSCRIBERS

NEW UNITS HARDWARE VERIFICATION

ASTRO SPECTRA MOBILE

DESCRIPTION

Check the subscriber for performance.

TEST INSTRUCTIONS

Check the following on the subject station

- Installationand user operation
- Frequency Reference Error _____HZ
- Transmitter Power, Forward / Reflected _____W
- Transmitter Analog/Digital Deviation _____KHz
- Receiver 12dB SINAD _____dBM
- Squelch Setting dBM

Circle templates tested. Model/Serial Number

Pass Y N Punch list Item #

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SUBSCRIBERS

CONTROL STATION TEMPLATES

ASTRO SPECTRA DESKTOP

DESCRIPTION

Check the subscriber programming for correctness against the system map.

TEST INSTRUCTIONS

Check the subscriber programming for correctness against the system map.

Repeat for the various templates.

Circle templates tested. 1 2 3 4 5 6 7 8 9
10 11 12

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SUBSCRIBERS

PORTABLE TEMPLATES

XTS3000

DESCRIPTION

Check the subscriber programming for correctness against the system map.

TEST INSTRUCTIONS

Select a subscriber and verify the programming to the system map.

Repeat for each template.

Circle templates tested. 1 2 3 4 5 6 7 8 9

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

SMARTZONE SUBSCRIBERS

MOBILE TEMPLATES

ASTRO SPECTRA

DESCRIPTION

Check the subscriber programming for correctness against the system map.

TEST INSTRUCTIONS

Select a subscriber and verify the programming to the system map.

Repeat for the various templates.

Circle templates tested. 1 2 3 4

Pass Y N Punch list Item # _____

Initials: Motorola _____ Customer _____

Test comments on the back.

3.4.19 Thirty-Day Test Plan

3.4.19 Thirty-Day Test Plan

3.4.19.1 Purpose

This definition of the thirty-day test plan will serve to clarify the conditions required to verify the performance of the City's simulcast radio system over an extended period, as required by the SOW.

3.4.19.2 General

The City, upon successful completion of the prescribed performance test period, shall accept the performance of the system. A period of 30 calendar days of successful operation following installation and performance verification of the fixed equipment shall constitute a successful performance test period. Prior testing required by the contract, including system-staging tests and fixed equipment site tests previously witnessed and approved by the City, shall be incorporated into this document.

The beginning of this performance period ~~shall be defined as the time when the system's electrical and operational features testing has been completed, the system has been approved by the Contractor for the City's beneficial use, and 75 percent of the~~ start upon successful completion of the installation and optimization of the system; optimization and performance verifications are successfully completed and the digital subscriber units are ~~in~~ ready for use. The Contractor shall submit a letter to the City signifying that the system is ready for test.

During the 30-day performance period, the City shall utilize the radio system for its intended purpose as much as possible, and shall test all operational modes and equipment configurations to ensure that all features operate properly, and that all system anomalies have been identified.

For the purposes of this Performance Test, the entire radio system shall consist of: the simulcast trunking subsystem including the Police console dispatch subsystem, Fire console dispatch subsystem, system management subsystem, Network Monitoring and Alarm Reporting subsystem, and the multiplexer subsystem.

To meet the standards for acceptance, the system shall operate without any major failure of equipment or equipment function which results in the inability of the overall system to perform as specified. However, any minor failures that are normally encountered during the operation of such a complex radio system shall not constitute a failure in achieving successful operation.

A minor failure shall not interrupt the 30-day performance window.

Any deficiencies noted during this test period shall be identified in writing to the Contractor and these deficiencies corrected by the Contractor in accordance with the maintenance response requirements stated in the contract.

The City's designated representative shall witness the performance period, and shall keep a detailed punch list of suspected system deficiencies. Within 14 business days following completion of the performance test, the City representative shall submit this punch list to the Contractor for analysis and prioritization of any corrections required.

A major failure of any subsystem shall cause the 30-day test period for that subsystem alone to be suspended until repairs have been made. Upon repair of the subsystem, the 30-day performance test will restart and must run for an additional 30 consecutive days without a major failure. Any subsystem which successfully completes the 30-day performance phase shall be designated "Passed" and shall not be subject to re-testing. When all subsystems have successfully passed the testing, the entire hardware system shall be declared accepted, subject to correction of punch list items noted during the testing phase.

3.4.19.3 Service Support

The City requires 24-hour maintenance of fixed system components for the duration of this test.

The City shall contact the Contractor's designated local service facility to report any system outage or deficiency.

3.4.19.4 Classification of Failures

To more clearly define the impact that equipment failures may have on overall system functionality, a description of the classifications of failures should be noted. These have been defined below.

3.4.19.4.1 Minor

3.4.19.4.2 Trunking System

A. Failure of no greater than one repeater channel, provided that such failures are corrected within the maintenance response time required by the SOW.

B. Failure of any equipment that does not cause the interruption of the trunking operation, wired trunked console dspatch functionality, or operation, provided that redundant equipment automatically switches into operation in accordance with the SOW.

C. Failure of a single wired trunked console dispatch position.

D. Failure of a site frequency standard, provided that redundant equipment automatically switches into operation in accordance with the SOW.

E. Failure of a single tower-top amplifier or antenna.

F. Momentary (10 second) system outages while switching to redundant control equipment.

G. Minor errors in subscriber equipment database affecting fewer than 25 non-fixed radios.

3.4.19.4.3 Microwave and Multiplex System

Malfunctions which cause a failure of three or fewer DS0 circuits.

Exclusion: the Contractor is not responsible for those components of the existing microwave system which were not subject to modification under this contract. Provided that such failures are properly identified and are corrected within eight hours, such excluded failures will not require a restart of the 30 day test. The test may continue with credit given for successful time which has already elapsed.

3.4.19.4.4 Network Monitoring and Alarm System

Malfunctions which cause a failure of a single workstation.

3.4.19.5 Major

3.4.19.5.1 Trunking System

Malfunctions which cause:

A. System in fail-soft.

B. Sustained communications failure exceeding one minute in duration.

C. More than one wireline console operator position off the air.

D. Greater than one channel resource down.

E. A simulcast failure affecting one or more sites.

F. Loss or failure of system controller configuration database.

G. Loss or failure of subscriber database affecting 25 or more non-fixed radios.

3.4.19.5.2 Microwave and Multiplex System

Malfunctions which cause a simultaneous failure affecting traffic of more than three DS0 channels.

Exclusion: the Contractor is not responsible for those components of the existing microwave system which were not subject to modification under this contract. Provided that such failures are properly identified and are corrected within eight hours, such excluded failures will not require a restart of the 30-day test. The test may continue with credit given for successful time which has already elapsed.

3.4.19.5.3 Network Monitoring and Alarm System

A. A failure affecting operation of all work stations.

B. A failure affecting more than a single RTU.

C. Loss or failure of configuration database.

3.4.19.6 Report

Failures detected during this test will be reported to the City on the standard work ticket format utilized by the Contractor. These reports will include, at a minimum:

A. Model and serial number of the equipment affected (asset number if applicable).

B. Original complaint, including time and date failure was first reported.

C. Revised complaint and/or trouble found.

D. Repairs made and parts used.

E. Technician name or control number.

F. Any recommended improvements to the system.

G. Any FCC required measurements made due to repairs.

A final report shall be submitted to the City within 30 days of the successful completion of this acceptance test. All items on the City's punch-list plus all failures uncovered by this test will be prioritized, and an action plan will be generated which addresses all of these issues.

3.4.19.7 Exclusions

Failures caused wholly or in part by the following conditions shall not be considered as conditional to system acceptance under this 30-day performance plan:

A. Acts of God, such as lightning, flood, fire, or earthquake.

B. Willful abuse or damage caused by any person or group of persons excluding acts by employees or agents of the Contractor or its subcontractors.

C. Work stoppage or strike for any reason except by employees or agents of the Contractor or its subcontractors.

D. Loss of adequate AC power for a period longer than provided for by contracted generator, battery or UPS backup power runtime.

E. Lack of performance of any City-supplied equipment (e.g. CAD host).

F. Failures resulting from anything outside reasonable control of Contractor.

G. Inability or difficulty communicating as a result of an on-channel, external radio frequency interference source.

EXHIBIT I Software Subscription Agreement

EXHIBIT I

Software Subscription Agreement

This Motorola Software Subscription Agreement ("Agreement") is between Motorola, Inc., a Delaware corporation ("Motorola") by and through its Commercial, Government, Industrial Solutions Sector (CGISS) and the City of Miami Beach, a municipal corporation organized under the laws of the State of Florida ("Customer"), and must be fully executed prior to the end of the Equipment's Warranty Period in the Communications System Agreement.

Section 1 DEFINITIONS

"Core Release" – A new version of Software which adds Features and major enhancements. These new versions are signified by changes to the first digit of the version identifier number (e.g. SmartZone 2.0.3 to SmartZone 3.0).

"Enhancement Release" – A superseding issue of Software which adds to, improves, or enhances the performance of Software Features contained in the then currently shipping Software version. These releases are signified by changes to the second digit of the version identifier number (e.g. SmartZone 3.1 to SmartZone 3.2).

"Feature" – A Software functionality.

"Standard Feature" – An additional Software functionality for components of Customer's system that is available to Customer in the standard Software release.

"Optional Feature" – An additional software functionality issued with a Core Release that is available to Customer at additional cost.

"Special Product Feature" – Features specially developed for Customer which contain Customer unique functionality.

Section 2 SUBSCRIPTION PROGRAM

2.1. During the term of this Agreement, Motorola will provide Customer with the software subscription services described below ("Software Subscription Agreement") for upgrade capable Motorola communications infrastructure equipment that is in the Customer configuration identified in Attachment 1 to this Agreement.

2.2. Non-Motorola software (i.e., Software owned by a party other than Motorola) are excluded from the Software Subscription Agreement. If these excluded software products are applicable to your System, they may be covered by a separate maintenance and support agreement.

2.3. Motorola will provide periodic Motorola Software Enhancement Releases applicable to Features currently provided to Customer by Motorola under a Software License Agreement. Customer is responsible for the purchase of additional hardware that is necessary to upgrade to the newly issued Enhancement Release.

2.4. If Customer decides on its own to make an upgrade, Motorola will provide those Standard Features included in a Core Release which apply to Customer's existing System components. The

Customer is responsible for the purchase and license of additional products, hardware, and/or software that are necessary to migrate to the newly issued Core Release.

2.5. Optional Features issued with a Core Release are not provided pursuant to the Software Subscription Agreement but are available to Customer, as a Agreement subscriber, at a discounted price under a separate agreement. The discount available to Customer for voice system Optional Features will be 20% off the current Motorola list price. The discount available to Customer for data system Optional Features will be 15% off the current Motorola list price. Once an Optional Feature is provided to Customer, Customer will be entitled under this Agreement to all Enhancement Releases for that Optional Feature.

2.6. Not Applicable.

2.7. Motorola will issue to Customer at the below address bulletins announcing Enhancement Releases and Core Releases. If Customer desires to obtain the announced Enhancement Release or Core Release, it must contact its Motorola representative. If needed, Customer should contact its local service provider for installation assistance.

Customer Contact for Bulletin Receipt

Customer: City of Miami Beach
Address: 1100 Washington Avenue, Miami Beach, FL 33139
Attn: Director, Information Technology

2.8. Because Enhancement Releases may include minor performance enhancements, Customer is encouraged to periodically upgrade the Motorola Software operating on its System with the most current Enhancement Release (e.g. SmartZone 3.0.1 to SmartZone 3.0.2). Customer may choose not to install a new software release, however, customer acknowledges that by so choosing, it may limit or eliminate the applicability of future releases to its System.

2.9. Because the Software Subscription Agreement includes Enhancement Releases for only the currently shipping software version and those prior versions that Motorola may be supporting during the term of the Agreement, Customer is encouraged to migrate the Motorola Software operating on its Communications System to the most current Core Release (e.g. SmartZone 2.0.3 to SmartZone 3.0). If Customer's system is not maintained to a currently supported software version, all Core Releases and Enhancement Releases may not be compatible with Customer's existing System. Additional hardware, Motorola Software, and engineered modifications may be required if Customer desires to migrate to a particular Core Release or Enhancement Release. Such additional hardware, Motorola Software and engineering are not included as part of the Software Subscription Agreement and may be provided pursuant to a separate agreement. If the size and complexity of Customer's System warrants, Motorola may provide consultation services to determine the technological, operational and financial impact of installing a particular Core Release or Enhancement Release on the System, pursuant to a separate agreement.

Section 3 FEES AND PAYMENT

Attachment 1 contains the annual SSA fees and payment terms. The fees listed are based upon Customer's current Motorola equipment configuration as indicated in Attachment 1. Customer must promptly notify Motorola of any change in this configuration and Motorola will calculate revised fees (effective at the beginning of the next subscription year) based on the new configuration. Motorola will refund to Customer any amounts previously paid for SSA fees that are reduced due to a new

configuration. If the SSA fees are increased due to a new configuration, Customer will pay any additional amounts within forty-five (45) days after receipt of an invoice from Motorola.

Section 4 TERM AND TERMINATION

4.1. The term of this Agreement is indicated in Attachment 1 and shall terminate at the expiration of that term unless extended by mutual agreement of the parties.

4.2. The Customer may terminate this Agreement at any time, without penalty and without liability, prior to the expiration of its term by providing written notice of such termination to Motorola. Such termination will be effective at the next annual anniversary date following Motorola's receipt of the written notice. Motorola will refund to Customer any pre-paid Software Subscription Agreement fees for the terminated period.

4.3. After the ten-year Serviceability Period in Exhibit B of the Communications System Agreement, the term of this Agreement will automatically terminate if, at its annual anniversary date, the software version in Customer's then current configuration is no longer supported by Motorola or if Motorola discontinues the Software Subscription Agreement or replaces software subscription services, in which case Motorola will refund to Customer any pre-paid Software Subscription Agreement fees or apply such on a pro-rata basis to the replacement services at the Customer's discretion for the terminated period.

Section 5 TAXES

Customer is responsible for all taxes due as a result of this Agreement, if any, other than taxes based on Motorola's income; if Customer is a tax-exempt entity, upon execution of this Agreement, Customer must provide Motorola with tax exemption certificates from the appropriate tax authorities.

Section 6 EXCLUDED SERVICES

The SSA does not include repair or replacement of hardware or software defects not corrected by the Enhancement Releases and Core Releases nor does it include repair or replacement of defects resulting from any nonstandard or improper use or conditions or from unauthorized installation of Motorola software.

Section 7 OWNERSHIP AND USE OF SOFTWARE

All rights and title to Motorola software furnished to Customer under this Agreement remains vested exclusively in Motorola. Customer's use of such Motorola software is subject to the terms of the Motorola software license agreement executed by Customer or, if no such agreement has been executed, Motorola's standard software license terms apply, which will be sent to Customer upon written request.

Section 8 DEFAULT

Motorola at any time may suspend subscription services or terminate this Agreement if (a) Customer fails to pay any fees within forty-five (45) days after such fees are due, (b) Customer fails to correct a breach of this Agreement within thirty (30) days after notice from Motorola of such breach, (c) Customer's right to use Motorola software under a Motorola software license agreement expires or is terminated, or (d) Customer replaces its Motorola communication system

with a non-Motorola communication system. Upon such termination, any unpaid SSA fees will become immediately due and payable due up to the date of termination.

Section 9 LIMITATION OF LIABILITY

EXCEPT FOR PERSONAL INJURY OR DEATH, MOTOROLA'S TOTAL LIABILITY ARISING FROM THIS AGREEMENT WILL BE LIMITED TO THE AGGREGATE AMOUNT OF SSA FEES PAID TO MOTOROLA BY CUSTOMER. NEITHER MOTOROLA NOR CUSTOMER WILL BE LIABLE FOR ANY COMMERCIAL LOSS; INCONVENIENCE; LOSS OF USE, TIME, DATA, GOODWILL, REVENUES, PROFITS, OR SAVINGS; OR OTHER SPECIAL, INCIDENTAL, INDIRECT, OR CONSEQUENTIAL DAMAGES IN ANY WAY RELATED TO OR ARISING FROM THIS AGREEMENT.

Nothing contained in this paragraph or elsewhere in this Agreement is in any way intended to be a waiver of the limitation placed upon the City's liability as set forth in Section 768.28, Florida Statutes.

Section 10 GENERAL

10.1. NOTICES: Notices required under this Agreement to be given by one party to the other must be in writing and either delivered in person or sent to the address shown below by certified mail, return receipt requested and postage prepaid (or by a recognized courier service), or by facsimile with correct answerback received, and shall be effective upon receipt.

Customer	Motorola, Inc., Southern Division
Attn: Director, Information Technology	Attn: Division Contract Manager
1100 Washington Avenue	789 International Parkway
Miami Beach, FL 33139	Sunrise, FL 33325

10.2. FORCE MAJEURE: Neither party will be liable for its non-performance or delayed performance if caused by an event, circumstance, or act of a third party that is beyond such party's reasonable control.

10.3. WAIVERS: Failure or delay by either party to exercise any right or power under this Agreement will not operate as a waiver of such right or power. For a waiver to be effective, it must be in writing signed by the waiving party. An effective waiver of a right or power shall not be construed as either a future or continuing waiver of that same right or power, or the waiver of any other right or power.

10.4. ASSIGNMENTS: Customer may not assign any of its rights under this Agreement without Motorola's prior consent.

10.5. ENTIRE AGREEMENT AND AMENDMENT: This Agreement, including Exhibit A, constitutes the entire agreement of the parties regarding the SSA and may be amended only by a written instrument signed by authorized representatives of both parties.

10.6. GOVERNING LAW. This Agreement shall be interpreted and construed in accordance with and governed by the laws of the State of Florida. Any controversies or legal problems arising out of this Agreement and any action involving the enforcement or interpretation of any rights hereunder shall be submitted to the jurisdiction of the State courts of the Eleventh Judicial Circuit

of Miami-Dade County, Florida, the venue sites, and shall be governed by the laws of the State of Florida. By entering into this Agreement, Motorola and Customer hereby expressly waive any rights either party may have to a trial by jury of any civil litigation related to, or arising out of this Agreement.

Customer	**Motorola, Inc.**
By:	By:
Name:	Name: Robert C. Wartmann
Title:	Title: MCEI Vice President, Sales
Date:	Date:

APPROVED AS TO FORM & LANGUAGE & FOR EXECUTION

City Attorney RK Date 4/25-03

ATTACHMENT
To Software Subscription Agreement

SYSTEM CONFIGURATION

Choose and complete only ONE of the sections below:

I. DataTAC System SSA

Number of Network Controllers in Operation
Number of Data Subscriber Devices in Operation (Forte, VRM, etc.)

IP Messaging for DataTAC (Yes / No)
RNC Redundancy for DataTAC (Yes / No)
Network Management for DataTAC (Yes / No)
Mobility Management for DataTAC (Yes / No)
Security Services for DataTAC (Yes / No)

II. SmartZone System SSA

Number of Sites (in addition to the Prime Site)
Number of Repeaters in Operation
Number of Subscribers in Operation (Mobiles and Portables)

OmniLink Operation (Yes / No)
Digital Operation (Yes / No)

Integrated Voice and Data (Yes / No)

III. SmartNet System SSA (Single Site or Simulcast)

Number of Remote Sites (in addition to the Prime Site)
Number of Repeaters in Operation
Number of Subscribers in Operation (Mobiles and Portables)

Digital Operation (Yes / No)

Integrated Voice and Data (Yes / No)

IV. Conventional System SSA

Number of Repeaters in Operation
Number of Subscribers In Operation (Mobiles and Portables)

Digital Operation (Yes / No)

Integrated Voice and Data (Yes / No)

V. Console Only SSA (not required if System SSA is purchased)

Number of Operator Positions
Number of Channels

VI. Centralink 2000 USA

SSA TERM

Beginning of Term (*choose one only*)

Expiration of existing Subscription Period (renewal)
Immediately upon execution of Software Subscription Agreement
Other (please specify date)

Length of Term (number of years: 1, 2, 3, 4, or 5)

SSA PROGRAM FEES

Annual Fees (*before discount*)

System SSA Fee
Console Only SSA Fee
CENTRALINK 2000 SSA Fee
SP Coverage Quote

Total Annual Fee (*before discount*)

Multi-Year Discount Level (*choose the discount corresponding to the length of term*)

☐ 1 Yrs. 0% ☐ 2 Yrs. 0% ☐ 3 Yrs. 5% ☐ 4 Yrs. 5% ☐ 5 Yrs. 10%

Total Annual Fee (*after discount*)
Total Fees during Term Chosen

Payment Methods (*check only one*):

(A) Payment of total Fees due upon execution of SSA

(B) Payment of Annual Fee due upon first day of each subscription year

(C) Other (*specify*)

EXHIBIT I

Enhanced System Support Statement of Work

Definitions

1.0 Definitions

Capitalized terms used in this Statement of Work and not otherwise defined within the Statement of Work, Communications System Agreement or other applicable Agreement have the following meanings:

1.1 Case: Electronic tracking document for requests for service through the System Support Center.

1.2 Continuously: Seven (7) days per week, twenty four (24) hours a day, three hundred sixty-five (365) days a year, or three hundred sixty-six (366) days in a Leap Year, including holidays.

1.3 Core Release: A new version of Software that adds Standard Features and major enhancements. These new versions are signified by changes to the first digit of the version identifier number (e.g. SmartZone 2.0.3 to SmartZone 3.0).

1.4 Customer: The end-user Customer as identified in the Communications System Agreement, Service Agreement or other applicable Agreement.

1.5 Customer Support Plan: A document mutually developed by Motorola and the Customer that provides information about the Customer and the System and describes the specific processes by which Motorola will deliver and the Customer will receive the services promised under this Statement of Work.

1.6 Enhancement Release: A superseding issue of Software, which adds to, improves, or enhances the performance of Standard Features contained in the then currently shipping Software version. These releases are signified by changes to the second digit of the version identifier number (e.g. SmartZone 3.1 to SmartZone 3.2).

1.7 Equipment: The equipment specified in the Equipment List as set forth in the Communications System Agreement, Service Agreement or other applicable Agreement, including any additions to the Equipment List during the Warranty Period.

1.8 Enhanced System Support (ESS) Period: The 12 month period commencing at the start of the Warranty Period for Equipment and Software as defined by the Communications System Agreement.

1.9 Event: An alarm or informational notification received by Motorola through the Network Management tools.

1.10 Firmware: Software in object code form that is implanted or embedded in hardware.

1.11 Infrastructure: The fixed Equipment excluding mobiles, portables, and accessories.

1.12 Maintenance: The process for determining the cause of Equipment failure, removing, repairing, or replacing parts or elements necessary in order to conform the Equipment with the manufacturer's specifications along with system specific specifications, delivering and reinstalling the parts, and placing the Equipment back into operation.

1.13 Motorola Software: Software whose copyright is owned by Motorola.

1.14 Response: Response times are defined as when a technician, a remote systems technologist or a remote network specialist is actively working the technical issue, remotely or on-site, as determined by Motorola.

1.15 Restore/Restoration: The effort required to bring Equipment to the level for which it was designed, engineered and adjusted for performance in accordance with the manufacturer's published specifications, although such Equipment may not necessarily be malfunctioning.

1.16 Servicer: a Motorola Authorized Service Station or Motorola Field Service personnel.

1.17 Software: Includes Motorola and any non-Motorola Software that may be furnished with the Communications System.

1.18 Standard Business Day: Monday through Friday, 8:30 a.m. to 4:30 p.m., local time, excluding Motorola holidays.

1.19 Standard Feature: A software functionality for components of Customer's System that is available to Customer in the standard software release.

1.20 Start Date: Effective start date as listed on the Service Agreement or other applicable Agreement.

1.21 System: System is the communications system as defined in the Communications System Agreement or other applicable Agreement.

1.22 System Acceptance: Unless otherwise defined in the Communications System Agreement, the date upon which Motorola has successfully completed all of the System tests as described in the acceptance test plan.

1.23 System Support Center: a Motorola facility located in Schaumburg, Illinois, the purpose of which is to serve as Motorola's centralized system support facility to compliment the field support resources. The System Support Center is hereinafter referred to as the "SSC."

1.24 Systemic: A software/hardware product defect related to or affecting the designed system operation.

1.25 Technical Support Operations: A centralized telephone support help desk that provides technical support for Motorola customers who have purchased Commercial Government and Industrial Solutions Sector (CGISS) products or have a contract for technical support.

Statement of Work
Enhanced System Support

Description of Services

Enhanced System Support (ESS) is a bundled service and support package designed to support both the software and hardware components of a new System during the ESS Period. By combining these services into a comprehensive and cohesive offering, Motorola is able to most effectively deliver technical support, diagnostic assistance, and restoration services in a thorough and timely manner.

During the ESS Period, ESS services supplement and compliment the Warranty as described in the Communications System Agreement. The full offering of ESS services is included in the Purchase Price of the System. After the ESS Period expires, these services are available for purchase under a separate agreement.

ESS services will be provided in accordance with the terms and conditions set forth at the end of this Statement of Work and in the Software Subscription Agreement which is attached as an exhibit to the Communications System Agreement. If any conflict exists between the Statement of Work provisions and the Terms and Conditions, the Terms and Conditions shall prevail.

Motorola Enhanced System Support is comprised of the following service products that will be described in greater detail later in this Statement Of Work:

- Dispatch Service
- Technical Support
- Network Monitoring Service
- OnSite Infrastructure Response
- System Survey and Analysis
- Advanced Replacement
- Software Subscription Agreement

- Infrastructure Software Installation
- Software Upgrade Design
- System Audit

Expansion, Replacement, or Phased Implementation Equipment

As indicated above, ESS services are provided to support a new System. However, if after System Acceptance new Equipment is being integrated with an existing System to expand the System, replace a major part of the System, or provide a subsequent phase of the System if it was originally sold as a multiple phase project, then such new Equipment will be covered as follows:

If the existing System is covered under its original ESS program, the new Equipment will be covered as if it were part of the original System for the remainder of the ESS Period.

If the existing System is not covered under its original ESS program but is covered under a service agreement with Motorola to provide services, then the new Equipment will be covered at the same level of service for the remainder of the term of that service agreement and the price for the service agreement will be increased to cover the additional Equipment.

If the existing System is not covered under either its original ESS program or a service agreement with Motorola, the new Equipment is covered only by the Equipment warranty and not by ESS.

ISD and Plant Exclusion

The ESS program originated from and was designed to support Motorola's radio systems business. After the ESS program was established, Motorola acquired certain companies and later created its Integrated Solutions Division ("ISD") as part of its Commercial, Government, and Industrial Solutions Sector. ISD includes Motorola's affiliated companies, Printrak International, Incorporated ("Printrak"), as well as the Motorola products of the former Suncoast Scientific, Incorporated (such as Customer Service Request/311 software) and the former Software Corporation of America (such as TxMessenger™, Premier MDC™ and other application software products under the "Premier" product name, and AirMobile™). Neither the ESS program nor the Software Subscription program covers the software, hardware, or services provided by ISD or by Plant Equipment, Inc. ("Plant"), Motorola's primary E911 solution subcontractor. ISD and Plant products and services may be covered by separate maintenance and support agreements.

1.0 Motorola has the following responsibilities:
- 1.1 All services described in the ESS Statement of Work will be provided in accordance with the terms of the Communications System Agreement and will cover only the Equipment and related Software.
- 1.2 Prepare a Customer Support Plan in conjunction with the Customer, preferably before System Acceptance.

2.0 Customer has the following responsibilities:
- 2.1 Prepare a Customer Support Plan in conjunction with Motorola, preferably before System Acceptance. The Customer must provide all information necessary to complete the Customer Support Plan.
- 2.2 Cooperate with Motorola and perform all acts that are reasonable or necessary to enable Motorola to provide the ESS services to Customer.

Statement of Work
Dispatch Service

1.0 Description of Services

The Call Center Operation (CCO) at Motorola's SSC provides Continuously a central point of contact for technical customer service requests. The CCO is staffed with customer support representatives who will coordinate the appropriate service response and resources. Service requests are tracked and monitored by Motorola from creation to close through an electronic Case process.

2.0 Motorola has the following responsibilities:

2.1 Continuously receive technical service requests from Customer or Motorola via telephone.

2.2 Open a Case and gather information from Customer to perform the following:

- Characterize the issue
- Determine a plan of action
- Assign and track the Case to resolution.

2.3 Dispatch a Servicer as required by standard procedures and provide necessary Case information collected in section 2.2.

2.4 Verify with Customer that Restoration is complete or System is functional, if required by Customer's repair verification preference as set forth in section 3.1. If verification by Customer cannot be completed within 20 minutes of Restoration, the Case will be closed and the Servicer will be released.

2.5 Ensure the required personnel have access to Customer information as needed.

2.6 Escalate the Case to the appropriate party upon expiration of a Response time.

2.7 Close the Case upon receiving notification from Customer or Servicer, indicating the Case is resolved.

2.8 Notify Customer of Case status via pager or email at the following Case levels as determined in section 3.1:

- Open and Close; or
- Open, Assigned, Arrival, Deferred, Closed.

2.9 Provide periodic activity reports to Customer.

3.0 Customer has the following responsibilities:

3.1 Provide Motorola with the following pre-defined information prior to service Start Date:

- Case notification preferences
- Repair verification preference

3.2 Call the SSC and provide the following information to the customer support representative:

- Assigned System ID number
- Problem description and site location
- Other information as requested by Motorola to open a Case

3.3 Verify with the SSC that restoration is complete or System is functional, if required by Customer's repair verification preference stated in section 3.1.

3.4 Complete and submit all required database and escalation procedure forms to be entered and stored at the System Support Center prior to System Acceptance.

3.5 Submit changes in any information supplied in the Customer Support Plan to the Customer Support Manager.

3.6 Cooperate with Motorola and perform all acts that are reasonable or necessary to enable Motorola to provide the Dispatch Service to Customer.

Statement of Work
Technical Support

1.0 Description of Services

The Technical Support Operation at Motorola's SSC provides to Customer's technical staff centralized remote telephone support for technical issues that require a high level of communications systems expertise or troubleshooting on the Equipment. The Technical Support Operation is staffed with technologists who specialize in the diagnosis and resolution of system performance issues.

Technical Support (i) shall not include software upgrades that may be required for issue resolution; and (ii) is only available for those system types supported and approved by Technical Support Operations; however, such support is covered under the Software Subscription Agreement.

Technical Support is applicable to the following system types: SmartZone v2.0.3 and higher, SmartZone/OmniLink, E911, Private Data v2.0.3 and higher, and SmartNet. The following equipment is not supported by Technical Support: Micor, DeskTrac Repeater Model #L35sum7000; MSF 5000 that are not part of a SmartZone system, NCP, and Darcom.

2.0 Motorola has the following responsibilities:

- 2.1 Provide Technical Support Operation availability for all Severity One issues Continuously.
- 2.2 Respond to requests for Technical Support in accordance with the Response times defined in Table B and Severity Levels defined in Table C in Appendix 1 at the back of this Statement of Work.
- 2.3 Advise caller with procedure for determining any additional requirements for issue characterization, Restoration, or known fix for issue resolution.
- 2.4 Attempt remote access to system for remote diagnostics, if possible.
- 2.5 As needed, coordinate with the Servicer or Customer in the field until close of the Case.
- 2.6 Coordinate technical resolutions with agreed upon third party vendor(s), as needed.
- 2.7 Escalate support issues to Motorola engineering and product groups, if necessary.
- 2.8 Provide a focal point for any Systemic issue and manage the Systemic issue to resolution.
- 2.9 Escalate the Case to the appropriate party upon expiration of a Response time.
- 2.10 Provide remote assistance, if needed, to install an Enhancement Release provided pursuant to the Software Subscription Agreement.

3.0 Customer has the following responsibilities:

- 3.1 Complete and submit all required database and escalation procedure forms to be entered and stored at the System Support Center prior to Start Date.
- 3.2 Submit changes in any information supplied in the above documents to the Customer Support Manager prior to the change taking effect.
- 3.3 Contact the System Support Center in order to access the Technical Support Operation, provide name of caller, name of Customer, System ID number, Service Agreement number, site(s) in questions, and brief description of the problem.
- 3.4 Supply on-site presence when requested by System Support Center.
- 3.5 Validate issue resolution prior to close of the Case.
- 3.6 Allow Motorola remote access to the System.
- 3.7 Cooperate with Motorola and perform all acts that are reasonable or necessary to enable Motorola to provide the Technical Support services to Customer.

Statement of Work
Network Monitoring Service

1.0 Description of Service

Network Monitoring Service electronically monitors specific elements of the System for Events. When an Event is detected, it is forwarded to the Motorola System Support Center using system specific monitoring tools. The System Support Center is staffed with trained technologists, who acknowledge the Event, run available diagnostic routines, and initiate an appropriate response.

Network Monitoring Service is applicable to the following system types: SmartZone, SmartZone/OmniLink v2.0.3 and higher, E911, Private Data v2.0.3 and higher with a WNG box, and SmartNet. The following equipment is not supported by Network Monitoring Service: Private Data

systems without a WNG box, Micor, DeskTrac Repeater; MSF 5000 that are not part of a SmartZone system; MTR 2000; MSR 2000; and NCP Data Base Stations.

When the Customer Support Plan is prepared or at any time thereafter during the ESS Period, Customer may elect to "Opt-Out" of the Network Monitoring Service by notifying Motorola in writing. Upon receipt of such notification, Motorola will not perform further Network Monitoring Service. Customer may choose to "Opt Back In" to Network Monitoring Service for the remainder of the current term of the applicable agreement by notifying Motorola in writing.

2.0 Motorola has the following responsibilities:
- 2.1 Recommend and coordinate installation of any needed connectivity or monitoring equipment.
- 2.2 Provide dedicated 56k frame relay necessary for monitoring SmartZone, SmartZone/ OmniLink, and Private Data system types.
- 2.3 Verify connections and Event monitoring prior to System Acceptance or Start Date.
- 2.4 Monitor System Continuously.
- 2.5 Access the Customer's System to perform remote diagnostics as indicated per Customer in section 3.6.
- 2.6 Create a Case when action is required.
- 2.7 Disable and enable System devices as needed for Servicers who go to the Customer's site when intervention is needed.
- 2.8 Verify service of Event as needed.
- 2.9 Provide activity reports to Customer on Case history.
- 2.10 Provide Performance Reports for SmartZone, SmartZone OmniLink, and Private Data system types.

3.0 Customer has to the following responsibilities:
- 3.1 Allow Motorola remote access Continuously to obtain System performance data.
- 3.2 Purchase any connectivity or monitoring equipment as determined by Motorola.
- 3.3 Cover any installation costs of connectivity or monitoring equipment.
- 3.4 Notify the System Support Center when Customer performs any activity that impacts the System. (Activity that impacts the System may include, but is not limited to, installing software or hardware upgrades, performing upgrades to the network, or taking down part of the System to perform maintenance.)
- 3.5 Allow Servicers access to Equipment (including any connectivity or monitoring equipment) if remote service is not possible.
- 3.6 Provide Motorola with pre-defined information prior to Start Date necessary to complete Customer Support Plan
- 3.7 Order and maintain dedicated dial-up phone lines for telephone service for SmartNet and E911 system types.
- 3.8 Cooperate with Motorola and perform all acts that are reasonable or necessary to enable Motorola to provide the Network Monitoring Service to Customer.

Statement of Work
OnSite Infrastructure Response

1.0 Description of Service

OnSite Infrastructure Response provides for on-site technician Response as determined by pre-defined severity levels set forth in Table C and Response times set forth in Table A-1 in order to Restore the System.

2.0 Motorola has the following responsibilities:
- 2.1 If Motorola is providing Technical Support service in addition to this OnSite Infrastructure Response service, Motorola will first respond in accordance with the Technical Support

service Statement of Work and Table A2, unless required to Respond otherwise in the Communications System Agreement or other applicable Agreement. If, in the performance of the Technical Support responsibilities, Motorola determines that an on-site technician is necessary, dispatch will occur promptly after such determination is made and on-site Response will occur in accordance with Table A-2.

2.2

2.3 Perform diagnostics on the component/Field Replacement Unit (FRU) /assembly.

2.4 Restore the System by replacing defective component/FRU/assembly.

2.5 Provide the FRU but only if the Advanced Replacement Statement of Work applies.

2.6 Provide materials, tools, documentation, physical planning manuals, diagnostic, and test equipment necessary to perform the service.

3.0 Customer has the following responsibilities:

3.1 Establish and maintain a suitable environment for the Equipment and provide the Servicer full, free, and safe access to the Equipment so that the Servicer may provide services.

3.2 .

3.3 Maintain and store any and all Software needed to Restore the System.

3.4 Cooperate with Motorola and perform all acts that are reasonable or necessary to enable Motorola to provide the OnSite Infrastructure Response services to Customer.

Statement of Work
System Survey and Analysis

1.0 Description of Service

System Survey and Analysis will provide operational test and alignment on the Customer's Equipment (infrastructure or fixed network equipment only) to ensure the Equipment meets original manufacturer's specifications, as set forth in the attached Table D System Survey and Analysis will be performed during Standard Business Days. If System or Customer requirements dictate this service must occur outside of Standard Business Days, Motorola will provide an additional quotation.

2.0 Motorola has the following responsibilities:

2.1 Notify the Customer of any possible System downtime needed to perform this service.

2.2 Physically inspect the infrastructure Equipment in the system (equipment cabinets, general circuitry, fault indicators, cables, and connections).

2.3 Remove any dust, and/or foreign substances from the Equipment.

2.4 Clean filters, if applicable.

2.5 Measure, record, align, adjust the Equipment parameters in accordance with the manufacturer's service manuals and the Rules and Regulations of the Federal Communications Commission (FCC), where applicable.

3.0 Customer has the following responsibilities:

3.1 Provide preferred schedule for System Survey and Analysis to Motorola.

3.2 Authorize and acknowledge any System downtime.

3.3 Maintain periodic backup of databases, Software applications and Firmware.

3.4 Cooperate with Motorola and perform all acts that are reasonable or necessary to enable Motorola to provide the System Survey and Analysis services to Customer.

Statement of Work
Advanced Replacement

1.0 Description of Services

Motorola will provide Customer with an advanced Field Replacement Unit (FRU) in exchange for Customer's malfunctioning FRU. A malfunctioning FRU will be evaluated and repaired by Motorola's System Support Center (SSC) and returned to the SSC FRU inventory upon completion of repair. Non-standard configurations and Customer-modified units are excluded from this service.

2.0 Motorola has the following responsibilities:

2.1 Maintain and provide access to an inventory of FRU, subject to availability, that can be shipped from SSC to Customer upon request as described in section in 3.1. Notwithstanding any statement to the contrary, the SSC reserves the right to provide to Customer a new or reconditioned FRU. The FRU will be of the same kit and version, and will contain similar boards and chips, as the Customer's malfunctioning FRU.

2.2 Program FRU to original operating parameters based on templates provided by Customer. If Customer's template is not provided or is not reasonably usable, a generic template will be used. Motorola reserves the right to upgrade the FRU at no additional charge to Customer.

2.3 Properly package and ship FRU from the SSC FRU inventory to Customer's address.

2.3.1 A FRU is sent next day air via Federal Express Priority Overnight or UPS Red unless otherwise requested. Shipments outside of the above mentioned carrier programs, such as NFO (next flight out), are subject to additional charges.

2.3.2 Motorola will pay shipping and handling during normal operating hours of Monday through Friday 7:00am to 7:00pm CST. Shipments outside standard business hours are subject to additional shipping and handling charges.

2.3.3 When sending the FRU to Customer, provide a return air bill in order for Customer to return the malfunctioning FRU.

2.4 Evaluate and repair Customer's malfunctioning FRU and return it to the SSC FRU inventory upon completion of repair.

3.0 Customer has the following responsibilities:

3.1 Call the SSC and request the FRU. The initial call to the SSC may be from Servicer if Servicer is acting on Customer's behalf pursuant to the OnSite Infrastructure Response Statement of Work.

3.1.1 Provide model description, model number, serial number, type of System and firmware version, and address of site location for FRU.

3.1.2 Provide Customer purchase order number to secure payment for any cost as set forth in section 2.3.1, 2.3.2. or 2.3.3.

3.2 Upon receipt of the FRU from the SSC FRU inventory, properly package Customer's malfunctioning FRU to the SSC within 5 days for evaluation and repair as set forth in section 2.4. Customer must send the return air bill, referenced in section 2.3.3 back to the SSC in order to ensure proper tracking of the returned FRU. Customer will be charged for a replacement FRU if not properly returned.

3.3 Maintain templates of Software/applications and Firmware for reloading of the FRU as set forth in section 2.2.

3.4 Cooperate with Motorola and perform all acts that are reasonable or necessary to enable Motorola to provide the Advanced Replacement services to Customer.

Statement of Work
Software Subscription Agreement

1.0 Description of Service

Motorola provides most Software releases by means of a Software Subscription Agreement ("SSA"). As more thoroughly discussed in the SSA, Motorola will provide to Customer periodic bulletins, which announce and explain available Enhancement Releases and Core Releases for Motorola Software for use with upgrade-capable Motorola Equipment covered by the SSA.

Non-Motorola Software (i.e., Software whose copyright is owned by a party other than Motorola) and some Motorola Software are excluded from the Software Subscription program. Examples of excluded Motorola Software are: Software developed or provided by a Motorola business sector other than CGISS; Radio Service Software; Customer Service Request/311 software, and mobile and host applications, message switch, and related software (such as TxMessenger™, Premiere MDC™, Airmobile™, and Virtual Control Head) that are marketed by Motorola's Integrated Solutions Division of CGISS or by Motorola's affiliated companies, Printrak International, Inc. These excluded Software products may be covered by a separate maintenance and support agreement.

2.0 Motorola has the following responsibilities:

- 2.1 Provide to Customer bulletins announcing Enhancement Releases and Core Releases.
- 2.2 Provide to Customer available Enhancements Releases and Core Releases as ordered by Customer. If Customer orders a new Enhancement Release or Core Release, provide those Standard Features included in the release that apply to Customer's existing System.

3.0 Customer has the following responsibilities:

- 3.1 Customer must contact its Motorola representative to order an available Enhancement Release or Core Release.
- 3.2 Pay any charges associated with additional engineering or hardware required for each Core Release that Customer chooses to order and install. Additional engineering may be required if Customer's System has specially developed options.
- 3.3 Use the Software and releases in accordance with the terms of the Motorola software license agreement executed by Customer or Motorola's standard software license agreement if no license was signed.
- 3.4 Cooperate with Motorola and perform all acts that are reasonable or necessary to enable Motorola to provide the Software Subscription Agreement services to Customer.

Statement of Work
Infrastructure Software Installation

1.0 Description Of Service

Infrastructure Software Installation provides the technical resources to install and activate one (1) Enhancement Release per year.

2.0 Motorola has the following responsibilities:

- 2.1 Install Enhancement Release that has been provided pursuant to a Motorola Software Subscription Agreement.
- 2.2 Install additional hardware as required by the Enhancement Release.

3.0 Customer has the following responsibilities:

- 3.1
- 3.2 Inform System users of upgrade plans and scheduled System downtime.
- 3.3 Cooperate with Motorola and perform all acts that are reasonable or necessary to enable Motorola to provide the Infrastructure Software Installation services to Customer.

Statement of Work
Software Upgrade Design

1.0 Description of Service

Software Upgrade Design includes design services for Enhancement Releases only. Motorola will review System audit data along with an equipment list to ensure there will be no Software incompatibilities between equipment that is not being upgraded versus equipment which is being upgraded with an Enhancement Release. Motorola will identify additional equipment and engineering that is required as a result of the upgrade and will recommend a plan for installation.

2.0 Motorola has the following responsibilities:
- 2.1 Review Infrastructure System audit data as needed.
- 2.2 Identify additional System equipment needed to implement an Enhancement Release.
- 2.3 Complete a proposal defining the Enhancement Release, equipment requirements, installation plan, and impact to System users that will fulfill the Customer's upgrade requirements.
- 2.4 Advise Customer of probable impact to System users during the actual field upgrade implementation.

3.0 Customer has the following responsibilities:
- 3.1 Contact Motorola upon receiving a bulletin to engage the appropriate Motorola resources for an Enhancement Release.
- 3.2 Cooperate with Motorola and perform all acts that are reasonable or necessary to enable Motorola to provide Software Upgrade Design services to Customer.

Statement of Work
System Audit (only applicable if needed for Software Upgrade Design)

1.0 Description of Service

A System Audit provides the technical resources to gather System configuration information. Depending on the specific requirements for the audit, information such as Software versions, hardware versions, model and serial numbers, equipment distribution and System layout/architecture is gathered and retained by Motorola. Motorola will provide a copy of the audit data to Customer.

2.0 Motorola has the following responsibilities:
- 2.1 Determine information to be collected in the audit, which may include Software versions, hardware versions, model and serial numbers, equipment distribution and System layout/architecture.
- 2.2 Contact Customer to schedule a mutually acceptable date and time for the audit, and inform Customer of scheduled System down-time in order to complete the audit.
- 2.3 Service will be performed during Standard Business Day hours.
- 2.4 Collect System audit data.
- 2.5 Provide Customer a copy of the audit data collected.
- 2.6 Notify Customer if malfunctioning Equipment is discovered during the audit and whether that Equipment cannot be audited due to the malfunction.

3.0 Customer has the following responsibilities:
- 3.1 Provide Motorola full, free, and safe access to the Equipment so that the Servicer may collect the audit data.
- 3.2 If subscriber units are to be audited:
  - 3.2.1 Provide a central location for the Servicer to receive the radio units and collect audit data.
  - 3.2.2 Communicate to all Customer subscriber users the audit schedule and location to bring the units.

3.3 If Motorola is unable to collect audit data on Equipment due to unavailability/access, Customer may be responsible for additional time and travel charges for the second attempt to obtain the audit information for that Equipment.

3.4 Cooperate with Motorola and perform all acts that are reasonable or necessary to enable Motorola to provide the System Audit services to Customer.

Appendix 1

TABLE A-2 – OnSite Infrastructure Response with Technical Support Response Times

SEVERITY	RESPONSE
Severity 1	Within 1 Hour from receipt of request for Technical Support On Site within 2 hours from time of dispatch
Severity 2 *	Within 2 Hours from receipt of request for Technical Support On Site within 4 hours* from time of dispatch*
Severity 3 *	Within next Business Day from receipt of request for Technical Support* On Site within 24 hours* from time of dispatch

*Standard Business Day

TABLE C –Severity Definitions

Severity Level	Problem Types
Severity 1	Major system failure 33% of System down 33% of Site channels down Site Environment Alarms (smoke, access, temp, AC Power) Response is provided Continuously.
Severity 2	Significant System Impairment Response is provided during Standard Business Days
Severity 3	Parts Questions Upgrades Intermittent problems System problems presently being monitored Response is provided during Standard Business Days.

Table D–Covered Equipment - SmartZone

SmartZone System Equipment	Operational Check (where applicable)
Repeater(s), Control Station(s)	Transmitter modulation
	RF power output/reflected
	RF Frequency Measured/adjusted
	Receiver Sensitivity Measured/Adjusted Power Supply voltages
	Audio Input & Output Level
	Check Low Speed Data
	Combiners & Circulator Loss
Consoles Positions/Remotes	Audio Input & Output Level
	Ethernet Operation
	CEB Power Supply Voltage, and AC Ripple
	Switches, Lights, CRT
	CEB Signal Levels
	Wiring and Grounding for each Position
	Check and Clean keyboards, CPU. CRT's
Central Controllers, Digitac, Comparators	Central Controller and Power Supplies
	T Bar Switched
	Simulcast Controller
	Simulcast Remote Controller
	Distribution Amp
	Digitac Comparator
	Receiver Multi-Couplers and Tower Mounted Amplifier
GPS	GPS RX/Controller
	Frequency Standard
	Calibration
Site Equipment	Audio Network Analyzer
	Baseline Database Server
	System Manager Terminal
	Site Test/System Calibration Equipment
UPS	Batteries
	Switch-Over Operations
	AC/DC Voltages
Other Equipment	Check all system printers
	Check all modems for proper levels & synchronization
	MBX/Other telco interface common equipment

Exhibit J Statement of Work and Addendum 1 & 2

Exhibit J

Statement of Work and Addendum 1 & 2

STATEMENT OF WORK

800 MHz TRUNKED DIGITAL SIMULCAST RADIO SYSTEM, DIGITAL MULTIPLEX , TOWER, SHELTER, AND SERVICES FOR CITY OF MIAMI BEACH, FLORIDA

October 16, 2001

Final (With Nov 8, 2001 revisions marked)

Nov 8, revisions accepted and Feb 13, 2002 changes in section 3.4.1 highlighted

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20020213 Miami Beach SOWG.doc

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1. STATEMENT OF WORK

This Statement Of Work (SOW) delineates the performance requirements for a turnkey APCO 16 compliant, ten-channel, 800 MHz Digital Simulcast Trunked Radio System for use by the City of Miami Beach, Florida. The system shall provide dual mode operation (analog and digital voice) and shall provide public safety IMBE digital dispatch facilities for Police and Fire operations. Public Works and other non-public safety City Departments will continue to utilize analog technology. Non-public safety dispatch operations will utilize RF control stations and remote control units at designated locations.

1.1 System Upgrade And Cutover

Due to the critical nature of public safety communications, it will be necessary to conduct the system upgrade and cutover without disturbing the operation of the City's existing Motorola SmartNet 800 MHz trunked system. Due to the limited space at some sites, it is expected that the existing Motorola SmartNet equipment will be temporarily relocated from beneath the existing cable trays and the new equipment installed in its place. During this phase, the Contractor shall be responsible for relocating the old equipment without causing service interruptions. It is expected that this will be performed "channel by channel" to prevent downtime.

During the system installation and cutover, and until final system acceptance, the Contractor shall be responsible for maintaining the existing SmartNet system and repairing any damage which may occur due to the cutover.

At all sites, the 800 MHz receiver antennas, tower-mounted preamplifier systems (two), transmission lines, and multi-coupler systems are to be replaced with new equipment at the time of the system upgrade.

At all transmitter sites, the existing transmitter antennas, transmission lines, and transmitter combiners shall be replaced with latest models compatible with the system's licensed parameters.

The existing grounding systems and surge protection equipment have served well over the years; however, the Contractor shall replace the surge protection devices (RF and utility service) with new units which comply with the latest industry standards. At a minimum, the Contractor's published site installation practices (M/A-COM LBI's, Motorola R56, or approved equivalents) shall be adhered to.

It is required that the new equipment be thoroughly staged at the factory and demonstrated as being fully operational prior to actual site installation. Further field testing of the new equipment will be performed to ensure that the new system is "de-bugged" prior to system cutover as described in Section 3 of this SOW. The Contractor and City shall mutually agree to the test plan.

1.2 Digital Voice Technology

The system shall utilize the IMBE (DVSI ▩) vocoder and shall consist of the latest software, firmware, and hardware relative to the Contractor or DVSI's ▩ latest release.

1.3 Dispatch Facilities

Digital Dispatch console operator equipment shall utilize the Contractor's highest tier graphical user interface.

Sufficient console operator equipment and support electronics to facilitate dispatch from a minimum of eight positions each with 21-inch color monitor shall be provided. Additionally, growth in single increments to twelve positions to be quoted as an option.

The cost for remote installation of two console operator positions (to be controlled via microwave circuits) shall be provided as an option.

A CAD interface shall be provided and integrated with City's PrintTrack CAD system.

The support of ten trunked simulcast channels in either analog or digital mode (selected by talk group) with consideration of potential growth to 20 trunked simulcast channels shall be provided.

Four (4) Mutual Aid control stations shall be provided and shall be interfaced with the CCEE via conventional channel interfaces, in addition, seven (7) other conventional interfaces shall be provided and interfaced with other customer provided stations.

One digital RF control station and antenna system for each console operator position (initially eight, with growth to eleven) shall be provided. These are to be utilized as a backup should console dispatch facilities fail. Each RF control station shall be installed in a common rack and shall be furnished with a digital remote control unit installed at the operator console. Each digital control unit shall be equipped with a foot switch and headset jack wired in the same manner as the console operator position to give the operator a quick means to recover control of the communications channel by simply transferring the headset from one jack to another.

1.4 Simulcast System

The simulcast system shall utilize the Contractor's latest simulcast technology. The system shall utilize GPS satellite signals as a primary reference for timing and frequency stability, with the ability to "freewheel" from an internal time-base for up to 72 hours in the event that GPS-based reference is lost at one, more than one, or all sites. In addition to providing the highest degree of control of frequency stability and delay timing, the simulcast audio (analog and digital) distribution system shall employ the Contractor's latest digital simulcast technology and shall provide the lowest distortion and group delay characteristics to ensure the highest degree of audio quality (and lowest bit error rate) when mobile and portable receivers are operated in non-capture overlap zones.

The simulcast system shall be initially sized for ten channels with future growth to 20 channels and shall support dual mode (analog and digital voice) operation on all system channels.

The simulcast system shall consist of three transmit-receiver sites and one receive-only site. The inbound path for mobile and portable voice and control signals (analog and digital) shall be controlled via a receiver voting comparator which selects the optimal receiver site on a continuous real-time basis. The voting comparator shall provide outputs to the dispatch console system via the base station interface and shall provide repeater audio via the simulcast distribution system. The system shall be adjusted to provide the best balance of receive audio regardless of the source of the transmission or mode of operation. Dispatchers and field users shall not be required to make adjustments to received audio levels to accommodate variations in system audio balance.

1.5 RF Coverage

The Contractor shall guarantee coverage throughout Miami Beach as described in Section 3.4 of this SOW. The system shall be designed to perform to the following parameters:

A. DAQ 3.4 audio quality.

B. 18 dB building penetration.

C. 97 percent area reliability.

D. Talk out to portable with flexible whip antenna worn on hip.

E. Talk back from portable with shoulder worn SMA microphone.

1.6 RF Interference Environment Evaluation

The Contractor shall perform an evaluation of the actual RF interference environment prior to detailed design review and shall identify any areas of concern, including noise floor, receiver desensitization, co-channel and adjacent channel interference, and intermodulation. The Contractor shall be prepared to identify the source of any interference and provide solutions to mitigate those effects on the system performance.

1.7 Standards and Regulations

Unless otherwise specified, the most current issue on the date of SOW issuance of the following publications and standards shall be a part of this SOW. In the event of inconsistencies between this SOW and these publications and standards, the requirements of this SOW shall take precedence.

A. FCC Rules and Regulations.

B. Electronic Industries Association Standards:

1. EIA/TIA-81 - Measuring Ground Resistance and Potential Gradients in the Earth.

2. EIA/TIA-195 - Electrical and Mechanical Characteristics for Terrestrial Microwave Relay System Antennas and Passive Reflectors.

3. EIA/TIA-210 - Terminating and Signaling Equipment for Microwave Communication Systems.

4. EIA/TIA-220 - Minimum Standards for Land Mobile Communications Continuous Tone Controlled Squelch Systems (CTCSS).

5. EIA/TIA-232 - Interface Between Data Terminal Equipment and Data Circuit-Terminating Equipment Employing Serial Binary Data Interchange.

6. EIA/TIA-252 - Standard Microwave Transmission Systems.

7. EIA/TIA-310 - Racks, Panels and Associated Equipment.

8. EIA/TIA-603 - Minimum Standards for Radio Transmitters, Receivers, and Transmitter/Receiver Combination Land Mobile Communications FM or PM Equipment, 25-1000 MHz.

9. EIA/TIA-329 - Minimum Standards for Land Mobile Communications Antennas, Part I - Base or Fixed Station Antennas, and Part II, Vehicular Antennas.

10. EIA/TIA-222F - Structural Standards for Steel Antenna Towers and Antenna Supporting Structures.

C. Military Standards:

1. Where specified, radio equipment shall meet specific requirements of parts of Military Standard 810.

D. National Fire Protection Association (NFPA):

1. National Fire Protection Association (NFPA) #1221

E. National Electrical Code.

F. APCO Project 16A and 16B Functional Guidelines.

G. Federal Aviation Administration (FAA).

1.8 Required Services

Services to be provided shall include the following:

A. Three-site simulcast, one receive-only site, ten-channel analog/digital APCO 16 trunked system.

B. Public safety dispatch facilities including digital IMBE operation.

C. Analog and digital subscriber radio equipment. See Appendix A for detailed quantities and types.

D. Antenna Networks.

E. Multiplexers.

F. 250-foot tower, equipment shelter, and emergency generator for 75th street site.

G. Maintenance of existing system infrastructure during system cutover.

H. Factory or field pre-installation testing and staging of all equipment listed.

I. Delivery and installation of the equipment identified in the requirements stated within this document.

J. Preparation of building permits and EPA submittals.

K. As-Built documentation and system manuals (three sets).

L. On-site electrical, mechanical, and functional checkout of complete system delineated by this SOW following installation by the Contractor.

M. Performance verification as described herein.

N. On-site dispatcher and system manager training.

O. One year warranty period maintenance.

1.8.1 Excluded Services

Certain services will not be required from the Contractor; these include any parts or components for the City-supplied existing equipment except as required to maintain during system cutover, or to interface new equipment.

1.9 Workmanship

All equipment and materials shall be new and free of corrosion, scratches, burrs, or such other defects as to present no other than new appearance. All equipment must be of current design and manufacture. Electronic equipment shall be of the Contractor's own design and manufacture to ensure system integrity, except that certain highly specialized units or modules (i.e., antennas, multicoupling systems, microwave equipment, etc.) which are listed by manufacturer's model number are exempt from this requirement. Design and construction shall be consistent with good engineering practice compatible with the

operating environment, and shall be executed in a neat and workmanlike manner. At a minimum, the Contractor's and manufacturer's published installation quality practices (M/A-COM LBI's, Motorola R56, or approved equivalents) and guidelines shall be adhered to and followed during the installation process. The Contractor shall take care to prevent damage to City-owned vehicles and facilities during the installation of the system.

1.9.1 Factory Staging

The Contractor shall stage all fixed equipment at the factory location. The equipment for each phase shall be made operational and shall be factory tested prior to installation in the field. The City, at its option, shall supply representatives to witness the factory staging and testing of the equipment. All equipment must be functional within the staged system prior to delivery acceptance. Digital multiplex equipment required for proper simulcast operation must be demonstrated with the 800 MHz trunked system at the factory.

1.9.2 Cutover Plan

The Contractor shall provide an updated detailed cutover plan for each user agency 60 days prior to equipment installation. Cutover cannot be phased; the existing Citywide systems must remain operational Citywide until completion of the 800 MHz project. The plan shall be approved by the City before commencement of installation.

The detailed cutover plan shall include a narrative description of the sequential cutover steps and a clear delineation of which tasks are the responsibility of the Contractor, which tasks are the responsibility of the City, and which tasks are the responsibility of others (such as Telco).

The existing communications system shall remain operational during the cutover phase. The Contractor shall provide a phased implementation plan that will ensure that no current dispatch function is negatively impacted or impaired during system cutover to the new communications system.

1.9.3 Installation Coordination

The Contractor shall carefully coordinate all phases of the work with the City to minimize equipment downtime. The coordination efforts shall be between the Contractor, the subcontractor, the City, existing equipment maintenance shop, and the telephone company. Conflict resolution shall be at the sole discretion of the City.

1.10 Equipment Removal

Following conditional acceptance of system performance, the old system equipment shall be removed from the sites for proper disposal by the Contractor.

The City wishes to retain certain equipment to be used as spares, including analog subscriber radios and accessories, RF control stations, BIM modules, base station antennas, and microwave dish antennas.

At the FS2 site, in addition to the 800 MHz trunking antennas being replaced, the Contractor shall remove abandoned UHF paging and 800 MHz mobile data antennas.

The existing Premysis channel banks which currently support the analog system shall remain the property of the City. Contractor may utilize the capacity of those existing channel banks in support of the conventional base station interfaces. Otherwise, the channel banks shall be removed and placed in City custody. Note: Some existing City computer traffic exists and is identified on the channel plan. Such circuits are to remain unchanged.

As a part of the as-built documentation, the existing microwave channel plan shall be modified or redrafted by the Contractor to reflect the final system configuration. The T1, VF, and serial data channel assignments shall be clearly identified by site and purpose. Likewise all unused T1, VF, and serial data channel assignments shall be clearly identified as being available. The channel plan shall clearly identify system synchronization nodes.

1.11 Site Restoration

In addition to the improvements and site rehabilitation described in the previous sections, all sites shall be cleared of dust and debris prior to system final acceptance. This shall include cleaning and polishing the tile floors of the 75th Street and Fire Station 2 sites. Other sites shall be mopped, swept clean, or vacuumed as applicable.

1.12 Spares

For each type of equipment, the Contractor shall provide spare modules and assemblies as required to maintain the level of service response required by the contract (two-hour response and four-hour repair of major system outages).

1.13 Sites of Work

The existing system consists of the following sites, all linked with a Harris (DVM10XT) digital microwave system. All microwave terminals and repeaters are HSWO.

The Contractor may assume that the microwave system has sufficient immediate capacity to provide two T1 circuits to each transmitter site, but shall verify that sufficient M1-2 cards are available for the build out. This is important as Harris is discontinuing this product and certain cards will be available only for a short time. The sites are listed from South to North as follows.

1.13.1 Rebecca Tower (Receive Only Site)

Rebecca Tower, located on Alton Road, is the furthest south site on Miami Beach. This site contains a receive-only site consisting of a SpectraTac receiver cabinet, Smartnet remote site controller, and a UPS system located within a rooftop equipment room. Space is tight;

however, sufficient space is available to co-locate the new receiver equipment with the old until the old system is dismantled and removed. The new receiver system will require four-hour battery backup power as the site lacks generator power.

The Contractor will install the following equipment:

A. Ten 800-MHz trunked satellite receivers (M/A-COM Mastr-III EDACS, Motorola AstroTac or approved equivalent).

B. GPS receiver (if required).

C. Interface panel.

D. Synch shelf.

E. Mux shelf.

F. Jackfields for testing.

G. 10 MHz distribution amp (if required).

H. Remote test unit/control channel monitor.

I. Miscellaneous cables, connectors, and hardware required to install above equipment.

J. Open racks, 86 inches.

K. One receiver multicoupler with tower mounted preamplifier with 10 MHz bandwidth preselector (TX-RX 420 Series or approved equivalent).

L. One receive antenna.

M. Lightning protection devices (Poly-Phasers).

N. All associated heliax, connectors, grounding kits, mounting kits.

Other services include:

A. Temporarily reposition existing SmartNet satellite receiver system and associated support equipment to accommodate permanent installation of new equipment.

B. Remove old antenna system.

C. Furnish and install UPS with four-hour backup battery in support of all equipment.

D. Upgrade electrical service as required to supply power to new equipment.

E. Upgrade internal grounding of site to meet industry standards (M/A-COM LBI's, Motorola R56, or approved equivalents) and terminate all new and existing equipment to ground system.

F. Furnish and install new primary SAD/MOV AC line surge protectors and provide phone line protector for site telephone.

G. Furnish and install secondary MOV surge protector.

H. Replace two overhead four-foot fluorescent light fixtures.

I. Vacuum floor, walls, and horizontal surfaces within site to remove standing concrete dust and debris. Paint all walls and floors with concrete sealing paint to control dust.

J. After system acceptance, remove existing 800 MHz equipment including transmission lines and antennas. Note: the City desires to retain LMR antennas as spares.

1.13.2 Old City Hall

The next site is Old City Hall, adjacent to Police Headquarters. This site contains a microwave repeater terminal and channel banks required to interface the dispatch console equipment (Centracom II remote operators) to the CEB, which is located at Fire Station 2. (Old City Hall communicates with Fire Station 2 via an intermediary site, New City Hall.) The work at Old City Hall will include the provision of a number of fiber optic interfaces (at T1 level) to be used with City-provided dark fiber between Old City Hall and the 4th floor of the Police Department Dispatch Center (directly next door at 1100 Washington Avenue).

A. Furnish and install new primary SAD/MOV AC line surge protectors and provide phone line protector for site telephone.

B. Upgrade internal grounding of site to meet industry standards (M/A-COM LBI's, Motorola R56, or approved equivalents) and terminate all new and existing equipment to ground system.

C. Upgrade electrical service as required to supply power to new equipment.

D. Furnish and install fiber equipment as required to interface with City-provided dark multimode fiber (eight pairs). This fiber will extend to the equipment room adjacent to the dispatch center.

E. Furnish and install locking storage cabinet sized appropriately for manuals and spares, including existing microwave system spares and manuals.

1.13.3 Police Department 1100 Washington Avenue (Dispatch and Equipment Rooms)

At the Police Department, the majority of the new dispatch consoles (quantity eight to ten) will be installed using existing furniture pods. The dispatch consoles will be electrically

collocated with the new simulcast control point and console central electronics equipment in an equipment room adjacent to the dispatch floor. This room has space to accommodate the simulcast and console electronics equipment. However, to make room, the City Public Works Department will be responsible for relocating or replacing the existing UPS to a location within the computer room (across main hallway at northwest corner of building). The Contractor shall be responsible for providing power distribution panels sized to accommodate the load of the new equipment.

1.13.3.1 Police and Fire Dispatch Center

The following equipment shall be installed in the Dispatch Center:

A. Dispatch Consoles

1. Eight consoles with 21-inch CRT and high-tier GUI (M/A-COM NT Maestro, Motorola Centracom Gold Elite or approved equivalent).

2. Eight gooseneck microphones.

3. Eight headset jacks.

4. Forty Supra headsets (priced as option).

5. Manual paging.

B. Other services to include:

1. Provide option cost to expand console operator positions from eight (8) to twelve (12) on a per position basis.

2. Provide an option to provide remote installation of two (2) of the above consoles via microwave DS0 circuits.

3. Furnish and install eight backup remote RF control stations (M/A-COM Digital Orion, Motorola Astro Spectra or approved equivalent) including eight digital remote controls, one per dispatch operator position. RF control stations shall be 19-inch EIA rack-mounted in the adjacent equipment room and shall be equipped with surge protectors, yagi antennas, and transmission line sufficient for exterior roof-mounted antenna installation on a Contractor-provided roof-mounting facility. In addition, a means to attenuate the transmit signal shall be provided to protect the system receivers from overload and intermodulation distortion.

4. Provide option cost to expand backup remote RF control stations from eight to 12 on a per position basis.

1.13.3.2 Dispatch Equipment Room (Control Point)

The Contractor shall install the following equipment and services:

A. System Manager Terminals(Communications Systems Director (CSD)/with full feature Software, Motorola MTZ3000/ SmartZone 4.1 or approved equivalent):

1. One system manager computer and CRT terminal for the dispatch equipment room.

2. One system manager terminal installed at the Tech Officer's office in the Dispatch Center.

3. One remote terminal to be located in the IT Department.

4. One local printer to be installed in the Dispatch equipment room.

5. One modem for remote access to the system manager.

6. One modem for connectivity to the remote terminal at the IT Department.

B. Site Control Equipment:

1. One site controller (SitePro Station Controller, Motorola SmartNet MTC3600 or approved equivalent).

2. Hot standby backup site controller(s) (SitePro Station Controller, Motorola SmartNet MTC3600 or approved equivalent).

3. Data switch to facilitate hot switchover (T-Bar or approved equivalent).

4. Two redundant downlinks.

5. Miscellaneous cables, connectors, and hardware required to install the above equipment.

6. Open racks, 86 inches.

C. Integrated Alarm System (M/A-COM EDACS IEA/CSD. Motorola Moscad, or approved equivalent):

1. Alarm computer.

2. 17-inch monitor for the control point.

3. 17-inch monitor for the supervisor console in the Dispatch Center.

4. Two sets of keyboard and mouse.

5. Miscellaneous cables, connectors, and hardware required to install the above equipment.

6. Open racks, 86 inches.

7. One modem for remote access to integrated alarm system.

D. Voting Equipment (M/A-COM EDACS, Motorola AstroTac 3000 or approved equivalent):

1. Digital voters - ten channels, four sites.

2. Analog voters - ten channels, four sites.

3. Power supplies.

4. Voter interface cabinet.

5. Miscellaneous cables, connectors, and hardware required to install above equipment.

6. Open racks, 86 inches.

E. Control Point Common Equipment:

1. GPS receiver.

2. 1.544 MHz clock selector, 1 pps reference (as required).

3. 10 MHz distribution amplifier.

4. CPTC shelves.

5. Synch shelves.

F. Transmit Control/Test Rack:

1. Oscilloscope.

2. Jack fields.

3. Test radio.

G. Audio distribution and MUX Rack:

1. Mux equipment for system connectivity.

2. Jackfields.

3. Audio distribution modules.

H. Fiber Optic:

1. Interface to City-provided fiber.

2. Fiber Mux.

3. Mux equipment for PD Dispatch and Old City Hall.

4. Battery system for fiber optic equipment. (8 hours at Old City Hall)

I. Console Common Electronics Equipment (CCEE) (M/A-COM Console Electronics Controller CEC, Motorola CEB/Embassy, or approved equivalent):

1. Base electronic unit.

2. Trunk system interface.

3. Redundant trunk system interface.

4. Eight console interface modules.

5. 32 audio ports to logging recorder (LRIM, LORI).

6. . Eleven channels, conventional control (CVIM,CIA,CI,BIM) as described in J-1 and 2, below.

7. PC, 17-inch monitor, and keyboard to be installed in the PD equipment room (M/A-COM MOM, Motorola ADM/CDM or approved equivalent).

8. Miscellaneous cables, connectors, and hardware required to install the above equipment.

9. Open racks, 86 inches.

J. Mutual Aid Interface:

1. Four RF control stations tied to the CCEE through the conventional interface.

2. Seven conventional interfaces provided for and interfaced with other customer provided stations.

K. Other services to include:

1. Furnish and install three 200A breaker panels with capacity for minimum 30 circuits. Supply source to be City-provided UPS system.

2. Furnish and install 20 amp breakers and circuits required to supply Contractor-provided equipment.

3. Furnish and install primary SAD/MOV surge protector device.

4. Furnish and install secondary MOV surge protector device.

5. Furnish and install Newton 24-inch wide cable raceway.

6. Furnish and install Polyphasor RF cable entry panel sized to accommodate all RF control stations used for mutual aid, backup. or network control purposes.

7. Upgrade internal grounding system to industry standards (M/A-COM LBI's, Motorola R56, or approved equivalents) including an overhead "halo" ground system.

8. Furnish and install ground buss bars.

9. Furnish and install channel bank equipment.

10. Furnish and install CAD interface to PrintTrack CAD system. Coordinate with PrintTrack as required to replicate current capabilities.

1.13.4 New City Hall

The New City Hall site serves two purposes. First, this site provides a drop point for VF circuits carrying low speed data to City Hall; second, it serves as a microwave repeater between Old City Hall and Fire Station 2. The work at this site will be limited to upgrading the grounding system and replacement of AC utility surge protection.

A. Furnish and install primary SAD/MOV surge protector device.

B. Upgrade internal grounding system to industry standards (M/A-COM LBI's, Motorola R56, or approved equivalents).

C. Install telephone line surge protector.

1.13.5 Fire Station 2, 2300 Pinetree Drive (Simulcast Site)

Fire Station 2 is a stucco, wood-frame structure, constructed on the roof of the Fire Department maintenance garage. A 200-foot self-supporting tower exists. This site now serves as the main transmitter site for the existing system. This site contains redundant 800 MHz Smartnet controllers and the Spectra-Tac receiver voting comparators. It also contains the existing console central electronics (CEB) and other equipment. In addition, it contains a microwave repeater serving this site and linking the New City Hall site to the Tower 41 site to the north. In the new configuration, this site will be used as a simulcast transmitter/receiver site. This site may potentially need to be relocated within two years; as a consequence, no simulcast control point or other common system equipment is to be located here.

The existing UPS system may be utilized if it can be demonstrated to provide sufficient capacity to support the old and new systems simultaneously. If not, a new UPS and maintenance bypass switch shall be provided with capacity to operate for two hours under full transmitter load.

As with the other sites, the grounding systems and surge protection equipment need to be brought to current standards.

The Contractor will install the following equipment:

A. Ten 800 MHz 100 watt trunked repeaters (M/A-COM EDACS Mastr-III, Motorola Quantar, or approved equivalent).

B. Ten simulcast options.

C. GPS receiver.

D. Interface panel.

E. Synch shelf.

F. Mux shelf.

G. Jackfields for testing.

H. 10 MHz distribution amp.

I. Remote test unit/control channel monitor.

J. Miscellaneous cables, connectors, and hardware required to install the above equipment.

K. Open racks, 86 inches.

L. Two transmit combiners, five channels each .

M. One receiver multicoupler with tower mounted preamplifier with 10 MHz bandwidth, redundant preamplifiers and test port (TX-RX model 421-86A-08-10-117 or approved equivalent).

N. Two transmit antennas.

O. One receive antenna.

P. Lightning protection devices (Poly-Phasers).

Q. All associated heliax, connectors, grounding kits, and mounting kits.

Other services to be provided include:

A. Temporarily reposition existing SmartNet system and associated support equipment to accommodate permanent installation of new equipment.

B. Provide new cable entry for new transmission lines; remove old antenna systems.

C. Upgrade electrical service as required to supply power to new equipment. Connect to the existing UPS system at cutover.

D. Upgrade internal grounding of site to meet industry standards (M/A-COM LBI's, Motorola R56, or approved equivalents) and terminate all new and existing equipment to ground system.

E. Furnish and install new primary SAD/MOV AC line surge protectors and provide phone line protector for site telephone.

F. Furnish and install secondary MOV surge protector.

G. Furnish and install new rain gutter above door and provide ground return.

H. Replace door threshold and seal.

I. Reposition by 90 degrees and reinforce, if necessary, the uni-strut bracket on the interior wall of the building, which holds an exterior mounted air-conditioning compressor to the east wall. Repair damaged interior drywall. Note: The uni-strut should have been mounted horizontally across the studs but instead was mounted vertically, eventually causing drywall to collapse.

J. As an option to above, provide replacement of the five-ton air-conditioning unit and relocate to the roof "I" beam. Include repair of the interior drywall.

K. Prime and paint interior walls and ceiling where water damaged. Use Kilz primer; repaint all walls and ceiling using white semi-gloss paint. Note: City to assume responsibility for roof repairs to shelter.

L. Replace damaged tower grounding system to achieve a 5 ohm ground. Use copper flat strap where conductors extend from tower legs across foundation piers. Flat strap is to be secured against foundation to prevent traffic abrasion.

M. Provide locking storage cabinet sized appropriately for system spares and manuals.

N. Rehabilitate exterior steel staircase by replacement of rusted-through diamond plate steel stair treads and landings. Treat all welds with cold galvanization, remove remaining surface rust, prime with rust preventative primer, and repaint entire structure. Note: this is a safety issue and should be fixed prior to equipment delivery.

O. After system acceptance, remove existing 800 MHz equipment, including transmission lines and antennas. Note: The City desires to retain LMR antennas as spares.

1.13.6 Tower 41 4101 Pinetree Drive (Simulcast Site)

Located on the roof of this condominium building, this site now serves as a redundant backup site for the Fire Station 2 site. Like Fire Station 2, this site contains redundant 800 MHz Smartnet controllers and the Spectra-Tac receiver voting comparators. Unlike Fire Station 2, this site does not contain any console central electronics (CEB) equipment.

Tower 41 will become the second simulcast transmitter receiver site and will be configured in a manner similar to Fire Station 2. The existing UPS system at this site may be re-utilized provided that the battery capacity can be expanded to provide four hours run-time at full channel load. An unused battery room exists on the floor below and may be utilized to house the UPS and batteries.

There are no generator facilities planned for this site; therefore the UPS run-time is critical.

Tower 41 also contains a microwave repeater serving this site and linking the Fire Station 2 site with the LaGorce Palace site to the north. In the new configuration, the northbound microwave path will be realigned ten degrees to the west and the antenna changed to a larger diameter dish to serve the new 75th Street Tower.

As with the other sites, the grounding systems and surge protection equipment need to be brought to current standards.

The Contractor will install the following equipment:

A. Ten 800 MHz 100 watt trunked repeaters (M/A-COM EDACS Mastr-III, Motorola Quantar, or approved equivalent).

B. Ten simulcast options.

C. GPS receiver.

D. Interface panel.

E. Synch shelf.

F. Mux shelf.

G. Jackfields for testing.

H. 10 MHz distribution amp.

I. Remote test unit/control channel monitor.

J. Miscellaneous cables, connectors, and hardware required to install the above equipment.

K. Open racks, 86 inches.

L. Two transmit combiners, five channels each .

M. One receiver multicoupler with tower mounted preamplifier with 10 MHz bandwidth, redundant preamplifiers and test port (**TX-RX model 421-86A-08-10-117** or approved equivalent).

N. Two transmit antennas.

O. One receive antenna.

P. Lightning protection devices (Poly-Phasers).

Q. All associated heliax, connectors, grounding kits, and mounting kits.

Other services include:

A. Temporarily reposition existing SmartNet system and associated support equipment to accommodate permanent installation of new equipment.

B. Remove existing antenna system.

C. Provide new cable entry for new transmission lines.

D. Upgrade electrical service as required to supply power to new equipment. Connect to existing UPS system at cutover.

E. Upgrade internal grounding of site to meet industry standards (M/A-COM LBI's, Motorola R56, or approved equivalents) and terminate all new and existing equipment to ground system.

F. Furnish and install new primary SAD/MOV AC line surge protectors and provide phone line protector for site telephone.

G. Furnish and install secondary MOV surge protector.

H. Install 220 MHz Civil Defense Repeater (relocated from LaGorce Palace) with new PD220-8 antenna, 7/8-inch Heliax transmission line and Polyphasor surge protector.

I. Replace and re-orient northbound microwave dish to align with 75th street site. Furnish and install 155 MPH rated WHP4-105-P3A dish.

J. Vacuum floor, walls, and horizontal surfaces within site to remove standing concrete dust and debris. Paint all walls and floors with concrete sealing paint to control dust.

K. Provide a portable air filtration unit and tow spare filters (Amaircare Air Filtration Systems Model 2500 with stage 2 HEPA filter (two to five years) or equivalent).

L. Provide locking storage cabinet sized appropriately for system spares and manuals.

M. After system acceptance, remove existing 800 MHz equipment including transmission lines, antennas, northbound microwave dish, and associated hardware. Note: the City desires to retain LMR and two-foot microwave dish antennas as spares.

1.13.7 LaGorce Palace (Site to be Abandoned)

LaGorce Palace currently serves as the City's northernmost receiver site. It is located on the roof of this condominium. Access to the equipment room is obstructed with horizontal chiller pipes. The Contractor is cautioned that care will be needed to provide sufficient manpower and equipment to carefully transport equipment across the roof without damage to property or persons.

The equipment room contains a SpectraTac receiver cabinet, a SmartNet remote site controller, a UPS system, and a microwave terminal. Additionally, this site contains a 220 MHz amateur radio repeater used for Civil Defense operations.

During the system cutover, the microwave terminal will need to be relocated to the new 75th Street tower site a few blocks to the north. In the meantime, the receiver site will need to be connected via City-provided leased circuits (two T1's required) to the 41st Street site.

Following the decommissioning of the old 800 MHz system, all equipment and antennas are to be removed from this site. The 220 MHz repeater is to be permanently installed at the Tower 41 site with a new antenna and transmission line.

A. Remove the microwave equipment from LaGorce to the new simulcast site located at 75th Street water reservoir site.

B. Connect existing site equipment to City-supplied T1's (two) during system cutover so that the receiver site will continue to function with the existing system.

C. Remove 220 MHz Civil Defense repeater to be relocated to the 41st Street site.

D. After system acceptance, remove existing 800 MHz equipment including transmission lines, antennas, microwave dish, and associated hardware. Note: the City desires to retain 220 MHz, 800 MHz and two-foot microwave dish antennas as spares.

E. Restore equipment room to original condition by patching holes in walls and painting interior and exterior walls to match adjacent walls. Certain improvements such as the air conditioner, security gate, utility meter, and AC distribution panel will be left in place. Floors will be swept and debris removed.

1.13.8 75th Street Facilities - Tower, Shelter, and Generator (Simulcast Site)

The site is located on the west side of the City's water treatment plant. A 250-foot Pirod tower and a 12-foot exterior by 42-foot exterior by nine-foot interior two room (two modules) pre-cast concrete shelter are to be furnished. The generator shall be installed in the

smaller room. The tower shall be capable of withstanding a 160 MPH basic windspeed. The shelter shall be capable of withstanding 150 MPH basic windspeed. The foundation shall place the finished floor of the shelter at eight feet N.G.V.D to protect against storm surges.

This site will serve as the third northernmost simulcast site. The microwave terminal equipment shall be relocated from LaGorce Palace. A new waveguide and antenna system compliant with the newly modified microwave license shall be installed on the tower and aligned with the new microwave antenna at Tower 41. A new UPS system shall be provided at this site and shall provide a two-hour runtime. An ONAN 50DGCA diesel generator with automatic transfer switch shall be furnished and installed within the 12-foot by eight-foot generator room within the shelter.

1.13.8.1 250 Foot PIROD Tower

A. Furnish and install a 250-foot PIROD tower designed to 160 MPH basic windspeed. Tower twist and sway shall not exceed ± 0.53 degrees at 115 MPH basic windspeed at the microwave dish attachment points. The tower shall be supplied with a cable safety climb system, EIA grounding, 21-foot lightning rod extender, FAA E-1.2 dual lighting system with controller and alarm, two sets of three 12-foot T-Frame section mounts, three Bogner antenna mounts, two 4-1/2-foot dish mounts, and expansion transmission line hanger brackets. The tower shall be designed to EIA-222F and shall sustain the following loading:

1. 250 feet: three Bogner (CELWAVE Penetrator) antennas each with 1-1/4-inch heliax, and six-foot side arm. (Provides expansion by one antenna)

2. 220 feet: one Bogner (CELWAVE Penetrator) antenna with preamplifier, 7/8-inch heliax, and six-foot side arm.

3. 190 feet: six PD1099 on three 12-foot Crown T-Frame each with 1-5/8-inch heliax for future leasing.

4. 160 feet: six PD1099 on three 12-foot Crown T-Frame each with 1-5/8-inch Heliax for future leasing.

5. 150 feet (verify): South, one (1) WHP4-105-P3A four-foot microwave dish with waveguide.

6. 150 feet: North, one eight-foot solid microwave dish with EW63 waveguide (future).

1.13.8.2 VFP Precast Concrete Shelter

A. Furnish and install a 12-foot by 42-foot (consisting of two modules) precast concrete shelter manufactured by VFP Industries, Virginia, or approved equivalent. Shelter roof shall support 150 pounds per square foot distributed loading and the floor shall support 300 pounds per square foot. The shelter is to be furnished with exposed

aggregate exterior finish, 1/2-inch white FRP paneling on walls and ceiling, R11 insulation, 1/8-inch vinyl tile flooring, interior cable tray, and interior halo grounding. The shelter shall be wired with AC service and minimum two 200-ampere distribution panels and circuits required to accommodate the ten-channel trunked system plus 100 percent channel expansion. Lighting shall be provided via minimum fifteen 80-watt surface-mounted fluorescent light fixtures with RFI suppression filters. Two emergency lights shall be furnished. HVAC shall be provided by two 42,000 BTU wall-mounted A/C units with low ambient humidity and compressor cycle and redundant lead/lag controls. One 2550 CFM exhaust fan shall be provided equipped with motorized intake and gravity exhaust louvers, thermostat, dust filter, bug screen, and fiberglass rain hood. Furnish one 20-pound dry chemical fire extinguisher and one ten-pound CO_2 fire extinguisher. Foundation shall be placed at eight feet NGVD and the shelter shall be tied down per manufacturer's recommendation to withstand 150 MPH basic windspeed.

B. Furnish and install one 12-port entry panel with four-inch sleeves, protective covers, and ground buss bar.

C. Shelter interior and exterior grounding system shall be installed in accordance with industry standards (M/A-COM LBI's, Motorola R56, or approved equivalents) and shall include a halo grounding system.

D. (Option) Furnish and install FM-200 fire protection system with warning signage, strobes, and audible alarm. System shall be sized and installed to suppress fire in either the generator or equipment room and shall be integrated into the FarScan alarm system. System shall be FIKE FM-200 or approved equivalent.

E. Provide and integrate into the alarm and monitoring system the following site alarms and devices: two heat detectors, two smoke detectors, two intrusion alarms, one high temperature alarm with adjustment range 30-110 degrees F, two air conditioner power failure alarms, UPS input power failure, UPS fail, UPS run, and generator alarms including: control switch not auto, generator running, low lube oil pressure, high coolant temperature, low engine temperature, over crank, over speed, low battery voltage, high battery voltage, low fuel.

1.13.8.3 ONAN Diesel Generator

A. Furnish and install ONAN 50DGCA diesel generator with OTPC260 automatic transfer switch.

B. Furnish and install 1000-gallon diesel above-ground storage tank and foundation set at eight feet NGVD with tie downs. Provide initial fill of 1000 gallons.

1.13.8.4 75th Street Site Simulcast

The Contractor will install the following equipment:

A. Ten 800 MHz 100 watt trunked repeaters (M/A-COM EDACS Mastr-III, Motorola Quantar, or approved equivalent).

B. Ten simulcast options.

C. GPS receiver.

D. Interface panel.

E. Synch shelf.

F. Mux shelf.

G. Jackfields for testing.

H. 10 MHz distribution amp.

I. Remote test unit/control channel monitor.

J. Miscellaneous cables, connectors, and hardware required to install the above equipment.

K. Open racks, 86 inches.

L. Two transmit combiners, five channels each .

M. One receiver multicoupler with tower-mounted preamplifier (with 10 MHz bandwidth, redundant preamplifiers and test port TX-RX model 421-86A-08-10-117or approved equivalent).

N. Two transmit antennas.

O. One receive antenna.

P. Lightning protection devices (Poly-Phasers).

Q. All associated heliax, connectors, grounding kits, and mounting kits.

Other services include:

A. Install antennas and transmission lines on new tower. Microwave dish shall be WHP4-105-P3A rated at 155 MPH. All transmission lines shall be secured to ensure survival at 115 MPH basic windspeed.

B. Perform alignment of microwave path between 75th Street site and 41st Street sites.

C. Install existing microwave radio (from LaGorce) into site; optimize and integrate into new system.

D. Provide cable entry for new transmission lines.

E. Furnish and install UPS system and maintenance bypass switch sized for two-hour runtime at full transmitter load.

F. Furnish and install grounding of site to meet industry standards (M/A-COM LBI's, Motorola R56, or approved equivalents) and terminate all new and existing equipment to ground system.

G. Furnish and install new primary SAD/MOV AC line surge protectors and provide phone line protector for site telephone.

H. Furnish and install secondary MOV surge protector.

I. Furnish and install vinyl clad chain link fence around tower and shelter compund. Fence shall be six feet high and topped with three strands of barbed wire. One 10-foot wide access gate to be provided.

J. Signage including trespass warning signs and FCC site ID.

1.13.9 Microwave Multiplex and Channel Expansion

The existing digital microwave system was recently installed and is believed to have sufficient capacity to support the new system and the existing SmartNet analog 800 MHz system during the transition. The Contractor shall provide the required multiplex and channel equipment to support all requirements of the new system. In the interest of minimizing the maintenance of dissimilar equipment, it is required that all Contractor-provided channel equipment be of like model and manufacturer and utilize the same versions of hardware, software, and firmware. The Contractor should make certain that each of the existing Harris DVM10XT microwave terminals are equipped with sufficient capacity (M1-2 cards, etc.) to build out the T1's required for the new system. Harris has recently discontinued regular production of this product line and will only produce a limited number of replacement boards.

1.14 Other Services

1.14.1 Control Station Installations

Control station installations are to be performed at a number of locations throughout the City. The Contractor shall perform the following tasks:

A. Assist the City in defining the fleet map.

B. Create installation plan.

C. Assist the City in creating control station radio programming "template(s)."

D. At each site, assist the City in determining the locations of control stations and desk sets.

E. Install RF local control stations.

F. Install equipment list supplied transmission line (not greater than 100 feet in length) and antenna system (connectors, coax grounding kit, yagi directional antenna, antenna mast and bracket, and surge protection.).

G. Connect to the City-supplied power and ground point within reach of the supplied power cord.

Local Control Station installation shall provide an antenna location no more than 100 cable feet from the RF control station, using coax transmission line through a free and easy cable pathway. It is assumed that the control station installations are a one-for-one replacement and that the antenna transmission line penetrations already exist. All control station antennas are to be permanently mounted to building exteriors at least ten feet above pedestrian traffic. Any exceptions will require written approval of the City.

All control stations will be programmed once before delivery, from a template that will be approved by the City, to ensure custom talk group assignments and option capabilities, if required. The Contractor shall provide a means such as an attenuator for decreasing the power output of the control stations in the event the control station experiences or causes interference. In each case, actual installation of the attenuator will be evaluated with respect to calculated impact on base station system IM performance and RF control path reliability.

1.14.2 Mobile Radio Installations

The Contractor shall perform the following tasks for mobiles radio installations:

A. Assist the City in defining the fleet map. Templates are to be "accepted" before en-masse installation.

B. Create installation plan and schedule.

C. Respond in a timely manner to installation schedule.

D. Assist the City in creating mobile radio programming "template(s)."

E. Establish the location of mobiles in vehicles.

F. Install prototypes for City inspection and approval.

G. Program radios.

H. Install radios.

I. Perform forward and reverse power checks on each mobile installation and record values for inspection.

J. Have inspection and approval on each vehicle at the time of installation.

K. Provide single control head mounting only.

L. Provide dual control head mounting for fire trucks.

1.14.3 Portable Radio Deployment

The Contractor will perform the following tasks for portable radios installations:

A. Assist the City in defining the fleet map. Programming templates are to be "accepted" before the start of en masse programming.

B. Create delivery plan for subscribers and accessories.

C. Program portable radios.

D. Deliver portable radios and chargers as per the equipment lists to the City's designated representative.

1.14.4 Training

The Contractor shall provide on-site training as specified below:

A. System Manager.

B. Console operator training.

C. Console administration and database management.

D. Portable and mobile operator "train the trainer."

2. SYSTEM DESCRIPTION

2.1 System Configuration

The selected Contractor shall supply the following system and equipment:

A. Simulcast trunked dual mode analog/digital base station equipment for a three-site simulcast, one receive-only site, ten-channel, 806 MHz system.

B. Dispatch console facilities.

C. Multiplex equipment expansion to existing microwave system as necessary to provide a complete system backbone.

D. Mobile and portable radios and RF control stations as listed in Appendix A.

The Contractor will be responsible for proposing and providing all equipment, services, and resources that are required to meet the performance requirements of this SOW. See Section 1 for detailed description.

2.2 Trunking Requirements

The selected Contractor shall provide an 800 MHz trunked radio system based upon the performance specifications contained herein. This section of the SOW provides an overview of the performance requirements of the system.

The system shall comprise sufficient 800 MHz frequency pairs (channels) within the 806 to 866 MHz allocation.

2.2.1 Channel Priority

RF channels shall be assigned automatically in real time by the system controller in response to system user (field units and console dispatchers) requests in accordance with channel availability and user assignment priorities. A minimum of eight levels of priority shall be incorporated in the system.

2.2.2 User Group Organizational Structure

To provide for flexibility and use of the trunked radio system and to provide additional flexibility and capability for future system operational expansion, at least 2000 individual talk groups shall be available within the system.

All field units (mobiles, portables, and RF control stations) and console dispatch positions shall be capable of being assigned user group address designators that shall permit communications between groups of field units or groups of field units and individual dispatch positions. All units operating within the same user group shall receive both sides of every conversation addressed to or from the group members.

The system shall be capable of individual call, group call (sub-fleet), and all call (fleet) voice communications and alerting.

The talk group plan must be submitted by the Contractor to the consultant and approved by the City prior to equipment programming.

2.2.3 Addressing and Signaling

The addressing and signaling system shall permit the assignment of a minimum of 16,000 discrete field unit addresses. All discrete addresses shall be able to be a member of any or all user groups. Regardless of the user group affiliation, the discrete unit address for a unit shall not change. Each unit shall have a unique discrete unit address.

Talk group addresses shall have the capability of being partitioned into various organizational user group structures. The selected Contractor shall assist the City in the development of a Citywide talk group plan.

2.2.4 System Access Time

The system controller shall automatically assign all RF channels. Each system user (field units, console dispatchers, etc.) shall have access to all RF channels via an operator-programmable priority protocol. Voice truncation time for each simulcast system shall be less than 500 milliseconds based on the following assumptions:

A. A voice or data channel is available for assignment.

B. Minimum receiver threshold.

C. Simulcast site configuration.

2.2.5 Private Conversation

The trunked radio system shall permit designated radios to have individual conversations with one another. This mode shall allow two units to have a conversation so that no one else is privileged to the communications, or is aware of it being requested. An originating radio user specifies the identification of the destination radio user and initiates the transmission. The destination radio user receives the transmission and is able to communicate with the originating radio user without having to change any settings on the radio.

2.2.6 Selective Alerting

The trunked radio system shall provide a means for selectively alerting radio units on an individual, group (sub-fleet), or all call (fleet) basis.

2.2.7 On-Channel Interference

The trunked radio system controller shall have the capability of detecting an interfering signal on any of the RF channel receivers. If such a signal is detected, the system controller shall shut down the associated channel transmitters and receivers for the duration of the interference. If the interference appears on the control/signaling channel, the system controller shall switch to an alternative control/signaling channel as well as remove the channel being interfered with from the system. Once the interference is gone, the RF channel shall be reactivated by the system controller for system use.

2.2.8 Out of Range (Contact) Indication

Whenever a field unit leaves the radio coverage area of the City of Miami Beach system, an alert to the user shall be provided. The user shall be notified of this condition by a visible or audible signal when the condition is first sensed.

2.2.9 Unit Disable

The trunked radio system shall provide the capability to allow the system supervisor, using a system manager terminal, to enable or disable any field units on the trunked system. The disabling of a field unit shall prevent the unit from monitoring any voice communications on any channel or user group in the system. A disabled unit shall not be able to transmit or otherwise join into any voice conversation on the system. The enabling or disabling function shall occur while the field unit is on the system anywhere within the radio coverage area. The system shall have the capability to search the trunked system for the unit. The system manager terminal shall provide a positive indication to the system supervisor when the system succeeds in enabling or disabling the unit. The field unit and system shall "handshake" so that the system shall have a positive indication of success.

This process shall not involve any "shutdown" of the system. This operation shall not require the use of any working channel. A disabled unit can only be re-enabled by the system supervisor. If for any reason the trunked system is shutdown or disabled, any disabled units shall stay disabled.

If the unit is not on the system at the time that the enabling or disabling function is initially invoked, the system shall have the ability to capture the unit when it comes into the system. When the target unit comes into the system, the system shall have the capability to "quickly" capture and automatically enable or disable the unit.

2.2.10 Unit Identification (ID)

Each unit (mobile, portable, RF control station, and dispatch console) shall send its unique discrete address identification to the system each time the unit transmits. The ID shall be displayed on the associated dispatch control console channel module as well as any other field units or RF control stations that are equipped with display capabilities. The ID that is

displayed shall be system programmable and shall be either the unit ID number or the plain language alias (fleet or sub-fleet or talk group or affiliation group or individual unit name) name.

2.2.11 Automatic Station ID

Automatic International Morse Code Station Identification shall be provided for the trunked radio system. Operation of the Automatic Station ID shall be in accordance with FCC Rules (90.647(b)) for trunked radio systems.

2.2.12 Dynamic Regrouping

The trunked radio system shall permit the reassigning of radio units to new or other temporary user group assignments. The reassignments can be initiated by the system supervisor using the system manager terminal.

This reassignment of user groups shall occur while the field unit is operating on the system anywhere within the RF coverage range of the system. The system shall handshake with the target unit and confirm that the requested change has been accomplished. The system manager shall be capable of regrouping field units once they have re-entered the RF coverage range or when they are powered up (turned on) at any time after the initial regrouping has taken place.

The system shall include the ability to perform this function manually and also with a stored software plan to allow for the automatic programming of many units into predetermined user groups. This reprogramming shall allow for the saved "plan" to be initiated at any future time by the system supervisor.

2.2.13 Trunking Protocol

The trunking protocol may provide "message" type trunking (repeater hang-time after release of PTT switch) or "transmission" type trunking (RF channel instantly reverts to pool of available RF channels) on the system. This feature shall allow reconfiguration of the trunking protocol as necessary and as future system operations dictate. With the "message trunking" protocol, an entire communications exchange generally occurs over the same RF channel. The repeater hang-time shall be adjustable while operating in the "message trunking" mode. With the "transmission trunking" protocol, the repeater generally drops each time a radio releases PTT, and the system controller assigns a new RF channel each time a radio PTT is initiated.

2.2.14 System/Site Controller

A primary system/site controller shall be provided and shall consist of the necessary hardware and software to provide overall monitoring and control of the trunked radio system. The system shall be responsible for automatically making RF channel assignments

and performing priority call queuing, late entry assignments, and data logging of system activity, and the system shall perform other unit and control activities as necessary to completely control the trunked radio system.

The system shall have the capability to receive requests for access to the system from field units (mobile, portable, RF control station) and from dispatch console positions via the control/signaling channel. It shall identify an unused RF channel and direct the signaling system to move the addressed unit or user group to the designated RF channel.

The system shall assign an RF channel in accordance with priorities and user group assignment procedures established by the City.

System software/hardware updates and/or changes shall be completed while maintaining continuous communications and without forfeiting any features or functions required by this SOW.

The trunked radio system shall be controlled by a primary site controller (system controller). Failure of the system primary site controller shall not cause the loss of any functions or features required by this SOW. Records management and APCO 16 priority system access shall be maintained.

The functionality of system primary site controller may be provided through a fault tolerant distributed processing architecture.

2.2.15 System Manager

A system manager interface shall be provided for control of the total trunked radio network by authorized personnel. The system manager shall allow data entry and retrieval from the system. Data retrieval shall include receiving control/signaling channel data and alarm messages from the various system controllers. Examples of data entry include altering system parameters, removing channels from operation, regrouping radio units, disabling radios, etc. The system manager shall be password protected from access by unauthorized personnel.

2.2.16 Database

A database shall be provided that will store system user profiles such as user group access, priority levels, dynamic regrouping plans, authorization codes, interconnect access, etc. Additionally, whenever a field unit is turned on and the unit is within RF coverage range of the system, the unit's discrete address and user group selection shall be recorded into the system database.

Whenever a field unit is on and is in RF coverage range of the system, any change of user group selection for the field unit shall automatically update the system database with the unit's ID (discrete data signaling address) and current user group selection.

The database shall permit user-defined sorting of calls by units, groups, time of day, duration of call, channel, site, and priority.

The database shall be continuously backed up. This backup database shall act as a "Hot Standby" database that is automatically kept current. Should there be a failure with the primary database, the backup database shall automatically be activated for system access. Alternately, the database may be mirrored between redundant controllers through a fault tolerant distributed processing architecture. Every 24 hours, the database shall be automatically backed up and stored on nonvolatile recording media, such as a tape drive.

The database shall have sufficient capacity to store all system profiles, as well as the capacity to store one month of system activity for report generation.

2.2.16.1 System Diagnostics

Sufficient hardware and software shall be provided to monitor and test the trunked radio system. The diagnostic system shall continuously test all RF repeater stations, site controllers, and other critical hardware and software functions. Should any abnormalities be found during a test sequence, the abnormality shall be logged in plain language (not coded characters).

At a minimum, the log shall include the type of problem encountered, the date and time, and the channel(s) or equipment where the problem occurred. Additionally, the diagnostics system shall activate audible and visible alarms to notify the system supervisor of the problem.

If a failure results in a loss of transmitter power or high VSWR on a repeater station, combiner, or antenna system, the system controller shall automatically remove that repeater station from the system until the fault is corrected. If interference is received on a radio channel, the system controller shall automatically remove that channel and associated receivers from the system until the fault is corrected. When a repeater station or a radio channel is removed from service, an alarm shall be sent to the system supervisor.

2.2.16.2 System Alarms

Alarm status information shall be accessible from the system manager terminal. The system supervisor shall be able to ask for and receive alarm conditions concerning the base station repeaters and controllers. The system shall be capable of having alarms printed out in plain language on a printer. This printer shall be included with the system supervisor terminals. Audible alarms must have a means to be silenced without resetting the visual indication.

A remote alarm indication subsystem shall be provided to capture diagnostic and alarm reports as well as summarize traffic operations.

At a minimum, the following trunked system alarms shall be logged and displayed:

A. Transmitter power/VSWR.

B. Control/signaling channel data integrity.

C. Working channel integrity.

D. Proper trunking operation of each channel.

E. System interference reception.

F. Miscellaneous alarms.

All individual system alarms must appear at the radio system management terminals. The Contractor is given latitude as to how the system alarms will be integrated.

2.2.16.3 Report Generation

The system manager shall be capable of generating management reports to provide the necessary information for management personnel to review the reports and make decisions regarding staff resource allocation and altering system size, and to evaluate the operational effectiveness of the various components of the trunked radio system. The reports shall include at least one month of system activity. At a minimum, management report generation shall be provided in the following areas:

A. Unit database.

B. Group database.

C. Site database.

D. Activity reports.

E. Site statistics.

F. RF channel statistics.

G. Alarm reports.

2.2.16.4 Activity Reports

The activity reports shall be available in a summary and detail report form. The activity summary report shall show a matrix for system activity for any specific time period selected by the system supervisor for each of the following type of messages:

A. Individual messages.

B. Group messages.

C. Emergency messages.

D. Data calls.

The following information shall be referenced to the above groupings:

A. Total number of messages.

B. Total time duration of messages.

C. Number of messages queued over the time period selected.

D. Total time consumed while in queued condition.

E. Average queuing delays and quantity.

2.2.16.5 System Manager Terminal

Three system manager terminals shall be included. The terminals shall consist of a desktop style keyboard, processor, software, CRT, printer, all necessary interconnect cabling, and 120 VAC power supply.

The system manager terminal shall allow an operator at the terminal to perform the following tasks:

A. Inquire about the status of alarms.

B. Inquire and make changes to the priority level assignments of any and all units in the system; the priority shall be assigned on an individual basis or by user group assignments or both.

C. Inquire about dispatch call loading information and telephone interconnect calls, if this option is provided.

The terminal shall display the real time activity of the trunked radio system at a designated location within the system. Real time information shall include, at a minimum, the following information:

A. Alarms.

B. Specific working channels in current use.

C. Specific working channels available for use.

D. Specific channel being used as trunking control/signaling channel.

E. Working channels removed from operation by the system manager.

F. Date and real time.

G. Type of communications activity in process: group, individual, emergency, data, etc.

H. Telephone interconnect activity, if provided.

I. Emergency calls.

J. Disabled units.

K. Queuing statistics.

L. Time duration of communications in progress.

M. Queue time delay of any radio channel.

N. Identification of calling and called parties using the system (unit ID).

The system manager terminal shall be capable of being connected with other terminals operating in a multi-tasking network. The system manager terminal shall be the master terminal with control over the other terminals. The master terminal shall be utilized by the system supervisor and it shall control which functions and user groups a user terminal shall interact with and display. The terminal shall include a printer to print reports and alarms.

2.2.17 Digital Voice Encryption

The trunked system backbone shall be capable of supporting digital voice encryption on each channel. Digital voice encryption shall not affect the system RF coverage range, or degrade the system in any manner.

The digital voice encryption technique shall meet the Federal Standard FS-1027 requirements and the National Security Agency (NSA) Data Encryption Standard (DES) standardized digital coding algorithm.

2.2.18 Reliability/Redundancy/Backup

A minimum of two trunking system failure modes shall be provided to minimize the loss of communications system features and functions.

2.2.18.1 Failure Mode One (Single Point Failure)

Due to operational requirements and system loading, a single point failure that would cause the system to revert to conventional (non-trunking) operation or non-simulcast operation

would degrade the system to an unacceptable level. For this reason, it is required that the system continue to trunk and provide all features, including radio coverage and APCO 16 features, in the event that the primary system controller or remote site controllers fail. Therefore, redundant system and site controllers and automatic switching facilities are required.

If the primary system or site controller fails, the system shall automatically switch to a backup system or site controller for trunking control. During this mode of operation, the system shall continue to provide all features, functions, and simulcast operation as specified in this document. The functionality of system primary and backup site controllers may be provided through a fault tolerant distributed processing architecture, provided that APCO 16 features and simulcast operation are maintained. The system shall not be "OFF THE AIR" for longer than ten seconds (maximum) during the system adjustment.

2.2.18.2 Failure Mode Two (Multiple Point Failures)

Should the trunked radio system fail to the point that centrally coordinated trunked operation can no longer be maintained, then the trunking system shall automatically revert to a pre-planned mode of operation known as failsoft.

The failsoft mode shall either be preprogrammed conventional failsoft or fault tolerant distributed processing trunking, whichever mode of operation is available from the vendor.The system shall not be "OFF THE AIR" for longer than ten seconds (maximum) during the system adjustment.

In the event that multiple failures in hardware or communications links result in a condition whereby simulcast operation can no longer be maintained, The 41st Street site shall be configured to operate on a standalone basis in the failsoft mode.

Should the system fail to provide full APCO 16 features such as emergency alarm during the failure mode two, the radio users and dispatchers shall be continually alerted to the failsoft mode of operation through an audible or visible alert.

2.2.18.3 Other Reliability Requirements

The system shall have the capability of assigning a minimum of four trunked repeater stations to perform as the control/signaling channel. When a new control/signaling channel is assigned, radio units shall automatically search for and acquire the new channel. The control/signaling channel shall periodically be rotated between trunked repeater stations. In the event that the control/signaling channel fails, the failure shall be detected and one of the remaining stations shall be automatically assigned as the control/signaling channel.

In order to equalize the utilization of voice channels, voice channel assignments shall be rotated with each PTT from a radio. For example, if the control/signaling channel is channel one, the first voice channel assignment may be channel two and the second channel

assignment may be channel three, and so on until it is rotated back to channel two again. This type of channel rotation shall operate in the "transmission trunking" mode only.

A monitoring device shall be provided at each RF site to monitor control/signaling activity, forward and reflected transmitter power, and up to eight other alarm inputs to be used as the City sees fit. The alarms shall automatically be reported.

2.2.19 System Alignment/Diagnostics/Test Equipment

To facilitate system alignment, optimization, trouble shooting, and repair of the communications system, a centralized diagnostic panel/rack shall be provided at a central maintenance facility. This rack shall include a switch panel that will enable or disable RF transmitters and other equipment operating in the system.

A patchable jack field shall be provided for all audio/data input and output lines of each major piece of equipment to facilitate monitoring, injecting test tones, and isolating interconnection circuits. The jacks shall include "normalled-through" contact arrangements and shall be wired in this manner for the most used circuits. A sufficient quantity of patch cords shall be supplied.

2.2.19.1 System Alignment/Optimization

Sufficient alignment control and test equipment shall be provided with the communications system to allow proper alignment and optimization of the trunked simulcast system. The equipment shall allow for injecting test tone that is swept across the audio bandwidth of the communications equipment and sent to the transmitters under alignment. A test receiver shall be remotely located in the test area and the received test audio shall be brought back to the central maintenance facility.

A storage oscilloscope shall be connected so that the x-axis corresponds to the frequency of the test tone and the y-axis corresponds to either the amplitude of the returned audio or the relative phase of the returned audio and test tone. A method of permanently capturing the oscilloscope patterns shall be provided. This shall be by photographic or graphic printing methods.

Adjustments in audio level and audio phase delay for all trunked simulcast RF channels shall be made from the central maintenance facility.

Automatic simulcast realignment upon any microwave loop switch action shall be provided.

2.2.19.2 Alignment Test Equipment

The alignment and optimization equipment shall be permanently installed in a rack at the central maintenance facility. The equipment complement shall include all necessary equipment, software, and hardware necessary to perform trunked simulcast system alignment and optimization.

2.2.19.3 Spare Parts Inventory

The Contractor shall furnish an itemized listing, with purchase costs, of spare parts, sub-assemblies, plug-in boards, and components that are necessary to keep in stock in order to maintain the communications system at a fully operational and function level. Spare voting modules shall be included on the list.

The Contractor shall provide contract pricing for replacement parts seven years beyond system acceptance.

2.3 Channelization

The City has been allocated a number of channels as follows:

CHANNEL FREQUENCIES

FREQUENCIES	BASE TRANSMIT	MOBILE TRANSMIT
Channel 1 *	860.9125	815.9125
Channel 2 *	860.7875	815.7875
Channel 3 *	859.9125	814.9125
Channel 4 *	859.7875	814.7875
Channel 5	858.9125	813.9125
Channel 6	858.7875	813.7875
Channel 7	857.9125	812.9125
Channel 8	851.6375	806.6375
Channel 9	856.9125	811.9125
Channel 10	856.7875	811.7875
Operational Bandwidth (**)	FH – FL = 9.275 MHz	FH – FL = 9.275 MHz

3. PERFORMANCE VERIFICATION

3.1 General

The Contractor shall verify system performance to the City prior to beginning the Performance Period. System performance shall be demonstrated by equipment/system tests and verifications.

The Contractor shall provide all necessary technical personnel and test equipment to conduct the tests. The Contractor shall coordinate with the City in regard to scheduling the tests and provide at least three weeks notice prior to performing the tests.

It is recognized that a variety of testing procedures and equipment may be utilized to verify a particular specification. Therefore, the Contractor shall be afforded latitude in this regard, provided the methods proposed are regarded as acceptable in the industry, as determined by the City and the City's technical consultant. All test results shall be recorded in a standardized format to be determined by the Contractor. The format to be used for recording test program data shall be submitted to the City for approval 30 days prior to testing. All recorded test program data shall be dated, witnessed, and signed by the contract managers and designated representative of the City and the Contractor. The entire test data shall be presented in a single test report.

3.2 System Acceptance Test Plan

A System Acceptance Test Plan (SATP) shall be submitted with the response. This plan shall form the basis for a mutually agreed upon SATP between the City and the Contractor. The SATP shall, as closely as possible, resemble the "real life" application of the equipment and shall include, but not be limited to:

A. Technical Compliance:

1. Fixed end equipment.
2. Field equipment.

B. Operational Compliance:

1. Consoles/control stations.
2. User units.

C. RF Coverage Compliance:

1. 800 MHz system coverage.

In addition to the Contractor-provided equipment, any existing City equipment to be modified and/or relocated shall be tested or demonstrated to be fully functional both before and after

modification and/or relocation.

3.3 Radio System

3.3.1 Equipment/System Tests

Following equipment installation, the following minimum tests shall be performed for each piece of equipment (including any modified and/or relocated existing equipment). Any equipment not meeting the requirements of this RFP shall be repaired or replaced by the Contractor without additional cost to the City. These tests shall be:

A. Base Stations:

1. Transmit frequencies.
2. Transmitter deviation/transmit bandwidth (normal speech).
3. Forward and reflected power at transmitter output.
4. Forward and reflected power at combiner output.
5. Insertion loss of combiner.
6. Receiver frequency.
7. Receiver threshold sensitivity.
8. Receiver multicoupler gain/loss.
9. Receiver effective sensitivity/tower mount preamp test.

B. Satellite Receiver Unit:

1. Receiver frequency.
2. Receiver threshold sensitivity.
3. Receiver multicoupler gain/loss.
4. Receiver effective sensitivity/tower mount preamp test.

C. RF Control Stations:

1. Transmit frequencies.
2. Transmitter deviation/transmit bandwidth (normal speech).
3. Forward and reflected power at transmitter output.
4. Receiver frequencies.

5. Receiver threshold sensitivity.

D. Voting Comparator:

1. Operational tests to be conducted to verify end-to-end proper functioning of each channel of each comparator.

E. Antenna and Transmission Line Tests:

1. All antennas and transmission lines shall be tested from the interior of the equipment buildings using Time Domain Reflectometry and a TDR unit capable of producing a hard copy of the results. This method of measurement shall indicate any impedance discontinuities in the transmission line/antenna system. Additionally, the VSWR shall be determined at the input connector of the transmission line.

   The Contractor shall provide suitable documentation of the test results. At a minimum, the TDR test data (photograph, thermal printout, or graphic drawing) shall be provided.

Mobile and portable radios shall be tested on a random sampling basis of 5% of each delivered lot (consecutive serial numbers). Failure to meet published specifications may result in the City rejecting the entire lot. Vendor shall then take appropriate action to correct all affected radios in the lot and upon resubmission of the lot for testing, the radios will be again sampled on a basis of 5% random units being tested.

F. Mobile Radios:

1. Transmit frequencies.2. Transmitter deviation/transmit bandwidth (normal speech).

3. Forward and reflected power at transmitter output.

4. Receiver frequencies.

5. Receiver threshold sensitivity.

G. Portable Radios:

1. Transmit frequencies.

2. Transmitter deviation/transmit bandwidth (normal speech).

3. Receiver frequencies.

4. Receiver threshold sensitivity.

H. Coverage Tests:

3.4.8 Portable Radio Configuration

Portable antenna performance can vary widely depending on the type of antenna used and the location of the portable antenna on the user's body. The coverage maps included for portable radios must show the coverage predicted for a 3 watt portable unit using a 1/2-wave flexible whip antenna at hip level and a 3 watt portable unit using a public safety speaker microphone antenna. Base to portable talk out coverage shall be analyzed with the portable unit at hip level using the 1/2-wave flexible whip. Portable to base talk back coverage is analyzed with a public safety speaker microphone antenna.

3.4.9 Inside Building and On-Street Coverage

The City of Miami Beach digital simulcast system shall be guaranteed to provide an 18 dB margin to meet the minimum requirements of heavy building coverage.

Building Type Definition:

Heavy: Large downtown building, large commercial building, condominium, hotel. or large enclosed shopping mall (four stories or more). Loss is typically 18 dB or more.

Medium: Small to medium size stores, small apartment buildings, or a small to medium size factory or office buildings (less than four stories). Loss is typically 11 dB or more.

Light: Residential buildings (one and two story houses) and other small commercial buildings. Loss is typically 6 dB or more.

3.4.10 Coverage In Specific Buildings

Except as specifically noted, the coverage prediction for "in building" locations need not include locations such as elevators, basements below ground level, tunnels, bank vaults, and other locations shielded by metal walls or with heavy construction and with no windows or doors. Since building loss can vary significantly depending on the construction of the building, the coverage maps need not predict coverage within any specific building. If coverage is needed in a specific building, then a field survey will be conducted.

The City has specifically addressed, in the SOW, coverage requirements for several buildings. These buildings are:

A. Mt Sinai Hospital (provide BDA as necessary).

B. South Shore Hospital (provide BDA as necessary).

C. Police Headquarters, 1100 Washington Ave (provide BDA as necessary).

D. Fountainbleu Hilton Hotel (verification only).

3.4.6 Antenna Site Equipment Parameters

Site # 1 – Rebecca Tower (Receiver Only)

Parameter	Transmit	Receive
Antenna Height	na	135 feet
Antenna Mounting	na	Roof
Antenna Gain	na	12.0 dB

Site # 2 - Fire Station Two

Parameter	Transmit	Receive
Antenna Height	200 feet	180 feet
Antenna Mounting	Top	Side
Antenna Gain	12.0 dB	13.4 dB
ERP	580 watts (preliminary, as licensed)	

Site # 3 – Tower 41

Parameter	Transmit	Receive
Antenna Height	215	215
Antenna Mounting	Roof	Roof
Antenna Gain	13.4 dB	13.4 dB
ERP	980 watts (preliminary, as licensed)	

Site # 4 – 75th Street

Parameter	Transmit	Receive
Antenna Height	250	230
Antenna Mounting	Top	Side
Antenna Gain	12.0 dB	12.0 dB
ERP	525 watts (preliminary, as licensed)	

3.4.7 Mobile Radio Configuration

The coverage maps included for mobile radios are to show the coverage predicted for a 35 watt mobile radio unit. This prediction shall be based on the mobile radio being installed in standard automobiles that are approximately five feet in height. For purposes of modeling coverage, the mobile antenna should be mounted on the roof of the vehicle.

and delay spread that falls below that required for audio circuit merit and reliability shall be identified in the coverage predictions and noted as an area of less than acceptable performance.

3.4.4 System Configuration/Antenna Sites

Site #	Site Name	Location Coordinates	Ground Elevation (Feet)	Structure Height (Feet)
1	Rebecca Tower Receive Only	25° 46'' 12" N 80° 08' 20" W		135
2	Fire Station Two	25° 47'' 58.3" N 80° 07' 52.1" W	4.9	200
3	Tower 41	25° 48' 52.3" N 80° 07' 33.1" W	3.9	215
4	75th Street	25° 51' 35.5" N 80° 07' 34.4" W	6.6	250

3.4.5 Equipment Parameters

3.4.5.1 General Parameters Subscriber Equipment

The parameters are as follows:

A. Mobile power — 35 watts (Public Safety)

B. Mobile antenna type — 3 dB

C. Portable power — 3 watts

D. Portable ant type (1) — 1/2-wave end or center fed, whip (Worst case talk out)

E. Portable ant type (2) — Public safety speaker mic. ant. (worst case talk back)

F. Faded Mobile Sensitivity — (DAQ 3.4)

G. Faded Portable Sensitivity — (DAQ 3.4)

3.4 Radio Communications Coverage

3.4.1 Coverage Reliability

The Proposer shall supply coverage maps to depict 97 percent area coverage for the locations enclosed within the predicted coverage contour for portable and mobile radio coverage.

Coverage maps shall be provided for mobile and portable configurations. For the purpose of coverage performance testing, the worst case of the portable in-building talk out or talk back configuration shall be confirmed. The Contractor and the City shall mutually agree on the performance depicted in the coverage prediction.

3.4.2 Received Signal and Circuit Merit

The Contractor must account for the users being in dynamic situations and adjust their prediction to provide for DAQ 3.4 performance in a moving faded environment using TIA/EIA TSB-88 methodology. DAQ 3.4 level audio quality in a faded environment requires more signal than in a stationary condition. Below is the TIA TSB-88 standard DAQ audio chart:

LEVEL (TIA TSB-88)	Description (TIA-TSB88)	SINAD equivalence
DAQ-1	Unusable, speech present but unreadable.	Less than 8 dB
DAQ-2	Understandable with considerable effort. Frequent repetition due to noise/distortion.	12 +/- 4 dB
DAQ-3	Speech understandable with slight effort. Occasional repetition required due to noise/distortion.	17 +/- 5 dB
DAQ-3.4	Speech understandable with repetition only rarely required. Some noise/distortion.	20 +/- 5 dB
DAQ-4	Speech easily understood. Occasional noise/distortion.	25 +/- 5dB
DAQ-4.5	Speech easily understood. Infrequent noise/distortion.	30 +/- 5 dB
DAQ-5	Speech easily understood.	Greater than 33 dB

3.4.3 Simulcast Coverage Performance Prediction

The Contractor shall predict simulcast coverage using TIA TSB-88 methodology which aggregates signal strength (signal to noise) and simulcast delay spread throughout the complete predicted coverage area. All areas within the predicted coverage contour are to be analyzed for the combined effect of signal strength and simulcast delay spread from all simulcast transmitters in the system. Any area that exhibits an aggregate of signal strength

17. Telephone patch operation.

18. Telephone interconnect operation.

19. Cross muting.

20. Correct programming per customer templates.

H. Logging Recorder/Reproducer:

1. Proper operation.

I. Instant Playback Recorders/Reproducers:

1. Proper operation.

J. System Manager and Control System:

1. Data logger.

2. Printers.

3. All software functions, including real time, on-line variation of report content and format, and the capability to restore and/or access and/or use as input to the report program(s) historical data.

4. CRT monitor/keyboard/system unit.

5. Failure mode operation.

6. Control station reassignment.

7. Fleet/sub-fleet assignment/reassignment.

8. Dynamic regrouping.

K. Microwave Radio Tests:

Applicable to the relocated path, as verification of path integrity during system acceptance.

1. Net path loss shall be measured and recorded for each RF path.

2. Received carrier power for each end of each path.

3. Calculation of flat fade margin.

4. Measurement of BER.

5. Service channel.

3. Conventional and trunked operation.

4. Correct programming per customer templates.

F. RF Control Stations:

1. Operational controls and functions.

2. User group selection.

3. Conventional and trunked operations.

4. Remote control of stations.

5. Unit identification display.

6. Correct programming per customer templates.

G. Control Consoles:

1. Conventional channel/trunked user group selection.

2. Transmit audio (level and quality) and VU meter operation.

3. Receive audio and call indicator operation.

4. Electronic clock operation.

5. Intercom operation.

6. Simultaneous select/merge operation.

7. Multi-auto select operation.

8. Muting capability, channel and system.

9. Radio/telephone/headset interfacing.

10. Transmitter keying and transmit indicator via foot switch and monitor.

11. Headset jack operation and muting of selected speaker.

12. Volume control operation.

13. Alert tone operation.

14. Supervisory control.

15. Paging control.

16. Parallel transmit/busy indication.

1. As defined herein.

3.3.2 Functional Tests

All equipment functions shall be demonstrated for all equipment specified in this document. These functional tests shall include but not be limited to the following:

A. All Trunked Stations:

1. Local operating controls.
2. Remote operating controls.
3. Trunked and failsoft operation.

B. Conventional Stations:

1. Proper operation.
2. Local operating controls.
3. Remote operating controls.

C. Voting Comparators:

1. Proper operation.

Mobile, portable radios and control stations shall be tested on a random sampling basis of 5% of each delivered lot (consecutive serial numbers). Failure to meet published specifications may result in the City rejecting the entire lot. Vendor shall then take appropriate action to correct all affected radios in the lot and upon resubmission of the lot for testing, the radios will be again sampled on a basis of 5% random units being tested.

D. Mobile Radios:

1. Operational controls and functions.
2. User group selection.
3. Conventional and trunked operations.
4. Correct programming per customer templates

E. Portable Radios:

1. Operational controls and functions.
2. User group selection.

With the three-site simulcast system, the Contractor shall guarantee coverage into the specific buildings listed above, with the exception of Fountenbleu Hotel, where verification of a hotel-owned internal BDA system performance will be performed at no risk to the Contractor.

In each of these structures, the testers shall test only in the ground level floors and emergency room locations unless otherwise stated. A minimum of 25 tests shall be performed in random locations throughout each structure.

A passing score will be 97 percent. If a structure fails any tests during the initial minimum of 25 test locations, the test regimen shall be increased to 100 locations. A passing score will be 97/100 locations.

3.4.11 Coverage Acceptance Test Plan

This Coverage Acceptance Test plan is designed to demonstrate that the RF coverage for units proposed to the City will meet the reliability requirement as agreed to by the City and the Contractor. A quantitative method of measurement will be used which involves the use of a calibrated test receiver, analog to digital converter, a portable computer, and a Global Positioning System (GPS) receiver. The GPS receiver will be used to determine the latitude, longitude, and speed of the test vehicle. The computer will be loaded with a mapping database that includes local streets, rivers, railroads, and other features. The computer will save the measured data for each grid that has been defined.

This test will be used to evaluate coverage provided by the proposed system for units in the following configurations:

A. Base to portable talk out to a unit with flex antenna at hip level inside 18 dB buildings.

   The automated test shall simulate the conditions above through the use of the adjusted ATP target level in the table below.

B. Portable to base talk in from a unit with a public safety speaker mic. antenna.

   The Contractor shall provide a report based upon extrapolation of the collected data to simulate the conditions of portable talk back. If known conditions of outside interference to fixed receivers exist, they shall be indicated in the report for discussion with the City. The effects of such interference shall be reported, but will not be considered for the evaluation score.

<u>The system shall be tested in the IMBE digital mode of operation.</u>

The acceptance criteria will be based on the demonstration that a signal equivalent to - DAQ 3.4 is available at an digital receiver input. This portion of the test will determine the RF signal levels within City. Uniformly distributed grids will be evaluated over the coverage areas described above. Ninety-seven percent of the grids tested must yield the required ATP

target signal level. (See calculation of ATP Target for inside 18 dB buildings, in the following tables.)

Configurations outlined above will be evaluated based upon reference field intensity measurements acquired by the calibrated measurement equipment. The test set shall be based on a calibrated test receiver inside a vehicle with a 1/4-wave antenna mounted on the outside center of the roof of the vehicle. During the field test, the automobile will travel to each of the test locations. At each location, outbound signal level measurements will be captured by the calibrated measurement equipment and these measurements will be used as reference levels upon which all other levels will be determined. During the analysis phase, the value for each configuration will be obtained through extrapolation to compensate for any system gain differences between the test equipment and each of the configurations to be evaluated.

Raw test data shall be provided to the City for independent analysis by the City's consultant. The raw test data shall contain the following:

A. Longitude and latitude of each test grid.

B. Raw data string of all RF signal samples or mean RF signal level and standard deviation corresponding to each test grid.

The file format may either be a text (.txt), (.xls), or other format importable into an EXCEL spreadsheet.

The following table indicates the values to be used to determine the ATP target reference signal level for each configuration. These represent the difference in system gain between the calibrated measurement equipment and each of the configurations. These values will be used in the analysis phase to evaluate acceptance.

Digital C4FM IMBE DAQ 3.4 Signal Threshold

Portable Antenna Degradation Relative To Mobile Test

Digital C4FM IMBE Faded Mobile Sensitivity (DAQ 3.4 = 2.0%/16.2dB) = -106.3 dBm *

	SMA	Flex Whip at Hip
Mobile antenna degradation	-1.0 dBd	-1.0 dBd
Mobile line loss	-1.8 dB	-1.8 dB
Portable antenna factor	+7.5 dBd	+10.9 dBd
Adjusted portable antenna factor	(+4.7 dB)	(+8.1 dB)
Receiver faded sensitivity (DAQ 3.4)	-106.3 dBm	-106.3 dBm
Adjusted portable antenna factor	+4.7 dB	*+8.1 dB*
Portable with SMA outside (DAQ 3.4)	(-101.6 dBm)	(-98.2 dBm)
Portable in heavy 18 dB buildings		
Receiver threshold (DAQ 3.4)	-101.6 dBm	-98.2 dBm
Heavy 18 dB building factor	+18.0 dB	+18 dB
Portable in heavy building (DAQ 3.4)	(-83.6 dBm)	(-80.2 dBm) ATP Target For talk out.

Digital EDACS FM IMBE DAQ 3.4 Signal Threshold

Portable Antenna Degradation Relative To Mobile Test

Digital FM IMBE Faded Mobile Sensitivity (DAQ 3.4 = 2%/15.7 dB) = -107.6dBm *

	SMA	½ Wave Whip at Hip
Mobile antenna degradation	-1.0 dBd	-1.0 dBd
Mobile line loss	-1.8 dB	-1.8 dB
Portable antenna factor	+10.0 dBd	+10.0 dBd
Adjusted portable antenna factor	(+7.2 dB)	(+7.2 dB)
Receiver faded sensitivity (DAQ 3.4)	-107.6 dBm	-107.6dBm
Adjusted portable antenna factor	+7.2 dB	+7.2 dB
Portable with SMA outside (DAQ 3.4)	(-100.4 dBm)	(-100.4 dBm)
Portable in heavy 18 dB buildings		
Receiver threshold (DAQ 3.4)	-100.4 dBm	-100.4 dBm
Heavy 18 dB building factor	+18.0 dB	+18 dB
Portable in heavy building (DAQ 3.4)	(-82.4 dBm)	(-82.4 dBm) ATP Target For talk out.

3.4.12 Coverage Testing Methodology

A. This test will be an RF signal strength measurement test using a calibrated mobile receiver to measure raw outbound signal from the simulcast base stations.

B. Computers provided by the Contractor in the automobile will be used to gather signal strength data.

C. The City will provide the vehicles used for the test.

D. An antenna will be connected to the antenna port of a calibrated Contractor-supplied test receiver monitoring the transmission from a repeater at each base station radio site. The antenna will be mounted on the outside center of the automobile roof. An analog to digital converter device will be connected between the signal strength indicator port of the mobile and the computer. A computer program will manage each gathering session and store the collected data on disks for later analysis. Following the completion of each day's test session, a digital copy of the drive test data shall be provided to the City or its consultant.

E. A quasi-random method of selecting evenly and uniformly distributed test locations will be used. The indicated required coverage areas will be divided into evenly distributed grids. The computer will display the grid structure as described, and overlay it on the screen on top of a base map showing the roads. The computer will provide a visual indication that data has been collected in a grid.

F. Signal strength at each location will be determined by taking 500 evenly timed data measured over a distance of 40 wavelengths. The average of these measurements will be computed to determine a signal level representative of the test location. An average of multiple samples is used rather than a single measurement to ensure that the measurement is not biased by taking a single sample that might be at a peak or null point on the radio wave. The resulting average will be referred to as the "Reference Grid Level."

G. The "ATP Target Reference Level" will be used, and through extrapolation, receive signal levels will be determined for each of the test configurations. For a particular configuration, if the receive signal level is equal to or greater than the ATP Target Reference Level, then the grid for that configuration will be declared passed. If the extrapolated receive signal level is worse than the ATP Target Reference Level then the grid for that configuration will be declared failed. If 97 percent of the grids are determined to be passed grids for a particular configuration, the coverage for that configuration will be declared passed. The successful passing of each of the configurations will constitute the criteria for RF signal strength coverage acceptance.

3.4.13 Prerequisites and Preparation

One automobile and driver supplied by the City will be utilized for this test. The Contractor will provide the calibrated measurement equipment for the test. The Contractor will conduct

the testing procedures. A representative for the City will accompany the test team, and the team members will be determined by the City prior to the testing.

3.4.14 Analyzing Data and Report Generation

During the field test, a computer file is generated which includes the signal level averages for each test location. This data will be placed in a computer spreadsheet during the analysis phase and summaries will be computed for each of the test configurations.

A report outlining the test and test results will be submitted to the City. The time frame for the report submission will be agreed to by City and the Contractor.

The successful completion of the automated coverage test will demonstrate sufficient signal strength to provide 18 dB building coverage throughout 97 percent of the area within the City.

3.4.15 Manual Delivered Audio Quality (DAQ) Test

It is generally accepted that digital audio quality is affected by a number of factors. The most significant are the signal strength and channel bit error rate (BER). While the automated test could measure BER in an automated method, it would be necessary to attenuate all of the system margin in the mobile test package. However, this still would not accurately portray the real operating environment. Therefore, a manual DAQ test will be performed.

Separate manual portable radio talk out and talk back tests shall be conducted for selected indoor locations within the City coverage area. The portable radio with speaker-microphone-antenna (SMA) worn on the lapel shall be tested for talk in (portable to base) and a portable at hip level shall be tested for talk out (base to portable).

The methodology of the delivered audio quality tests will be based upon the TIA TSB88 subjective descriptions. A two-way test message will be transmitted at each test location and recorded by each listener. During the tabulation, the messages will be checked for accuracy. Successful transmission of the test message will be the sole evaluation criterion for the manual DAQ test.

Successful completion of the manual DAQ test will demonstrate the proper operation of the digital simulcast system with respect to RF faded signal thresholds and bit error tolerance.

Buildings in each grid will be tested through the transmission of a standardized test message. Buildings failing the test will be later evaluated to determine the building loss by measurement of the available signal strength outside of the building and comparing it to the signal strength measured within the building. A building which fails the DAQ 3.4 test shall be included in the test scoring if the building loss is found to be <u>18 dB or less</u>. A building which fails the DAQ 3.4 test shall be excluded from the test scoring if the building loss is found to be <u>greater than 18 dB</u>. In this case, the City may select an alternative building in the same grid for later testing, as the initially selected building demonstrates a loss of more than 18 dB.

Building losses will be established by measuring the signal outside a building and a signal measured inside a building. Measurements outside buildings will be gathered by placing the automated measuring equipment on a cart or using a handheld signal strength measuring device. The measurement will be along at least three sides of the building being tested (as far as practical limits allow). The mean of these signal measurements will establish the outside signal level. The measurement will then be moved inside the building. At locations where the voice quality test fails, the signal will be measured at that point to obtain the in-building signal strength for that specific test point.

3.4.16 Coverage Performance Guarantee

The Contractor shall guarantee RF coverage performance in accordance with the requirements of this document. A minimum of 97 percent of the test locations shall provide a voice quality of DAQ 3.4 or better as determined by the test methodology set forth in this document. If the RF coverage performance of the simulcast trunked radio system supplied by the Contractor fails to meet the coverage requirements stated in this document, the Contractor shall modify or otherwise cause the system(s) to meet the minimum requirements of this document at no cost (direct or indirect) to the City. If corrections to the system are required, all coverage tests will be repeated as necessary for any portion of the system determined by the City to have potentially been impacted by the correction work done by the Contractor. The City retains the option to require that all coverage tests be repeated in the event that the simulcast system requires modification or repairs during the conduct of any testing.

3.4.17 Test Location

A statistically significant number of buildings shall be randomly chosen as test locations within the grids of the City coverage area. If buildings do not exist within the grid, then the test shall be conducted from inside of a passenger vehicle and duly noted.

Tests will be conducted within typical buildings having 18 dB or less building loss. These are described as heavy density or large type structures.

As described previously, random building locations which demonstrate greater than 18 dB building loss will be excluded as test points if the building fails but will be retained as part of the test results if the building passes.

Test locations within buildings will be selected by the field tester and will fairly simulate locations typically encountered by public safety personnel. By way of example, but not of limitation, tests in apartment complexes will be conducted in the hallways or stairwells of said complexes. No attempt will be made to seek out unusually high-density areas within buildings such as boiler rooms or underground parking areas.

One test location will be selected within each random building. The location will be on the ground level of the building.

Talk in testing will be conducted with the use of a shoulder or lapel microphone with an integral antenna (SMA type) mounted at shoulder level on the exterior of all clothing. The shoulder/lapel microphone and antenna will be connected directly to a portable radio that will be mounted in a belt holster. Additionally a portable with a flex whip antenna will be mounted at hip level for talk out testing.

3.4.18 Test Methodology

A. A "standard test message" is defined as the following sequence and will be evaluated as one DAQ 3.4 test message:

1. Call.

2. Call acknowledgment.

3. In-bound message.

4. Out-bound message.

5. Sign off.

B. The test message will contain the following information:

1. The inbound test message will consist of the words "Test Number" concatenated with the following information:

a. Grid number.

b. Decimal point followed by test point within that grid.

c. Five randomly generated two-digit numbers.

As examples: "Test Number 345.1, 12, 42, 57, 14, 88" is the first attempt test conducted for the first location in Grid 345; *and* "Test Number 345.2, 13, 45, 58, 17, 89" is the second test attempt conducted for the first location in Grid 345.

C. The outbound test message will consist solely of five randomly generated two-digit numbers.

D. Random numbers will be generated by a computer for each district and submitted to testers and dispatchers immediately before each test day. Neither field testers nor dispatchers will have any knowledge of the other's random test number sequences prior to the test.

E. The tester will sign off with "10-4"

F. If the test message is not clearly received by either the dispatcher or the tester, the test sequence shall be repeated once more; with the tester allowed to move the radio antenna from one side of their body to the other, without changing their location. This shall be flagged on the score sheet as a second attempt. If this second attempt is a pass, the test point passes.

G. If human error or distraction causes a transmission to be missed, the test sequence will be repeated and a notation will be made in the score sheet.

H. The test cycle is complete.

After each day's test session, the original test forms will be delivered to the City's Project Manager. Copies will be made for the City and the Contractor for immediate review.

After all test cycles are completed, the standardized test forms will be tabulated and scored. A completed test cycle must contain the exact random test messages, correlated with the test grid number, to be considered a pass. DAQ 3.4 will be achieved by the reception of the exact random test messages by both the console operator and tester.

Testing will be conducted at a statistically significant number of grid locations (one point per grid) within the City coverage area.

To eliminate possibility of error on the part of the testers, at tabulation, each failed test message will be analyzed for patterns indicative of commonly confused number pairs. For example, the pairs 59 versus 69 and 60 versus 16 are commonly confused. Such number confusion will be corrected during the scoring, provided the error is obvious and is the sole cause of failure of a given test sequence. The successful passing of 97 percent of the tested areas will constitute the criteria for acceptance of the DAQ test. (See Appendix B.)

3.4.19 Thirty-Day Test Plan

3.4.19.1 Purpose

This definition of the thirty-day test plan will serve to clarify the conditions required to verify the performance of the City's simulcast radio system over an extended period, as required by the SOW.

3.4.19.2 General

The City, upon successful completion of the prescribed performance test period, shall accept the performance of the system. A period of 30 calendar days of successful operation following installation and performance verification of the fixed equipment shall constitute a successful performance test period. Prior testing required by the contract, including system-staging tests and fixed equipment site tests previously witnessed and approved by the City, shall be incorporated into this document.

The beginning of this performance period shall be defined as the time when the system's electrical and operational features testing has been completed, the system has been approved by the Contractor for the City's beneficial use, and 75 percent of the subscriber units are in use. The Contractor shall submit a letter to the City signifying that the system is ready for test.

During the 30-day performance period, the City shall utilize the radio system for its intended purpose as much as possible, and shall test all operational modes and equipment configurations to ensure that all features operate properly, and that all system anomalies have been identified.

For the purposes of this Performance Test, the entire radio system shall consist of: the simulcast trunking subsystem including the Police console dispatch subsystem, Fire console dispatch subsystem, system management subsystem, Network Monitoring and Alarm Reporting subsystem, and the multiplexer subsystem.

To meet the standards for acceptance, the system shall operate without any major failure of equipment or equipment function which results in the inability of the overall system to perform as specified. However, any minor failures that are normally encountered during the operation of such a complex radio system shall not constitute a failure in achieving successful operation.

A minor failure shall not interrupt the 30-day performance window.

Any deficiencies noted during this test period shall be identified in writing to the Contractor and these deficiencies corrected by the Contractor in accordance with the maintenance response requirements stated in the contract.

The City's designated representative shall witness the performance period, and shall keep a detailed punch list of suspected system deficiencies. Within 14 business days following completion of the performance test, the City representative shall submit this punch list to the Contractor for analysis and prioritization of any corrections required.

A major failure of any subsystem shall cause the 30-day test period for that subsystem alone to be suspended until repairs have been made. Upon repair of the subsystem, the 30-day performance test will restart and must run for an additional 30 consecutive days without a major failure. Any subsystem which successfully completes the 30-day performance phase shall be designated "Passed" and shall not be subject to re-testing. When all subsystems have successfully passed the testing, the entire hardware system shall be declared accepted, subject to correction of punch list items noted during the testing phase.

3.4.19.3 Service Support

The City requires 24-hour maintenance of fixed system components for the duration of this test.

The City shall contact the Contractor's designated local service facility to report any system outage or deficiency.

3.4.19.4 Classification of Failures

To more clearly define the impact that equipment failures may have on overall system functionality, a description of the classifications of failures should be noted. These have been defined below.

3.4.19.4.1 Minor

3.4.19.4.2 Trunking System

A. Failure of no greater than one repeater channel, provided that such failures are corrected within the maintenance response time required by the SOW.

B. Failure of any equipment that does not cause the interruption of the trunking operation, wired trunked console dispatch functionality, or operation, provided that redundant equipment automatically switches into operation in accordance with the SOW.

C. Failure of a single wired trunked console dispatch position.

D. Failure of a site frequency standard, provided that redundant equipment automatically switches into operation in accordance with the SOW.

E. Failure of a single tower-top amplifier or antenna.

F. Momentary (10 second) system outages while switching to redundant control equipment.

G. Minor errors in subscriber equipment database affecting fewer than 25 non-fixed radios.

3.4.19.4.3 Microwave and Multiplex System

Malfunctions which cause a failure of three or fewer DS0 circuits.

Exclusion: the Contractor is not responsible for those components of the existing microwave system which were not subject to modification under this contract. Provided that such failures are properly identified and are corrected within eight hours, such excluded failures will not require a restart of the 30 day test. The test may continue with credit given for successful time which has already elapsed.

3.4.19.4.4 Network Monitoring and Alarm System

Malfunctions which cause a failure of a single workstation.

3.4.19.5 Major

3.4.19.5.1 Trunking System

Malfunctions which cause:

A. System in fail-soft.

B. Sustained communications failure exceeding one minute in duration.

C. More than one wireline console operator position off the air.

D. Greater than one channel resource down.

E. A simulcast failure affecting one or more sites.

F. Loss or failure of system controller configuration database.

G. Loss or failure of subscriber database affecting 25 or more non-fixed radios.

3.4.19.5.2 Microwave and Multiplex System

Malfunctions which cause a simultaneous failure affecting traffic of more than three DS0 channels.

Exclusion: the Contractor is not responsible for those components of the existing microwave system which were not subject to modification under this contract. Provided that such failures are properly identified and are corrected within eight hours, such excluded failures will not require a restart of the 30-day test. The test may continue with credit given for successful time which has already elapsed.

3.4.19.5.3 Network Monitoring and Alarm System

A. A failure affecting operation of all work stations.

B. A failure affecting more than a single RTU.

C. Loss or failure of configuration database.

3.4.19.6 Report

Failures detected during this test will be reported to the City on the standard work ticket format utilized by the Contractor. These reports will include, at a minimum:

A. Model and serial number of the equipment affected (asset number if applicable).

B. Original complaint, including time and date failure was first reported.

C. Revised complaint and/or trouble found.

D. Repairs made and parts used.

E. Technician name or control number.

F. Any recommended improvements to the system.

G. Any FCC required measurements made due to repairs.

A final report shall be submitted to the City within 30 days of the successful completion of this acceptance test. All items on the City's punch-list plus all failures uncovered by this test will be prioritized, and an action plan will be generated which addresses all of these issues.

3.4.19.7 Exclusions

Failures caused wholly or in part by the following conditions shall not be considered as conditional to system acceptance under this 30-day performance plan:

A. Acts of God, such as lightning, flood, fire, or earthquake.

B. Willful abuse or damage caused by any person or group of persons excluding acts by employees or agents of the Contractor or its subcontractors.

C. Work stoppage or strike for any reason except by employees or agents of the Contractor or its subcontractors.

D. Loss of adequate AC power for a period longer than provided for by contracted generator, battery or UPS backup power runtime.

E. Lack of performance of any City-supplied equipment (e.g. CAD host).

APPENDIX A

SUBSCRIBER EQUIPMENT REQUIREMENTS

APPENDIX B

LETTER FROM AUDIOLOGY ASSOCIATES OF NORTH FLORIDA

AUDIOLOGY ASSOCIATES OF NORTH FLORIDA
A Division of Tallahassee Ear, Nose & Throat - Head & Neck Surgery, P.A.

Adrian Roberts, M.D. - Physician Director

1408 Centerville Road
Suite 5400
Tallahassee, Florida 32308
Telephone: (904) 671-8172

3334 Capital Medical Blvd.
Suite 600
Tallahassee, Florida 32308
Telephone: (904) 877-4094

305 West Hansell Street
Thomasville, Georgia 31792
Telephone: (912) 228-6660

1315 South Main Street
Moultrie, Georgia 31768
Telephone: (912) 890-6574

July 2, 1998

Omnicom, Inc.
Joe Leikhim
930 Thomasville Road
Suite 200
Tallahassee, FL 32303

Re: In-Building Voice Quality Test

As per our conversations, I have reviewed the data you gave me. Examination of the 107 number pairs failures provided to me suggested some apparent errors throughout the test sequence. I can not determine if the errors are statistically significant (nor am I qualified to do so), however, there were definite patterns to the errors. The numbers were compared within and between number pairs. When the test numbers read were compared against the test numbers heard, 59 of the 107 number pairs fell into one of three categories:

I. The numbers 50 – 59 vs. the numbers 60 – 69 (i.e. 53/63).

II. Numbers ending in "ty" vs. "teen" (i.e. 60/16).

III. A number undetected possibly due to inflection differences or individual voicing styles.

Category: I

There were 19 number pairs judged to be included in this category.

	Test # read	Test # heard		Test # read	Test # heard
1.	51	61	11.	53	63
2.	66	56	12.	54	64
3.	52	62	13.	56	66
4.	69	59	14.	52	62
5.	69	59	15.	59	69
6.	62	52	16.	59	69

	Test # read	Test # heard		Test # read	Test # heard
7.	35	65	17.	36	66
8.	50	60	18.	54	64
9.	57	67	19	55	65
10.	69	59			

The /θ/, /s/, /t/ and /x/ phonemes in the words fifty and sixty are commonly mistaken for one another. The frequency range of /θ/, /s/, /t/ and /x/ is between 4000 and 6000 Hz. This overlap is the probable cause for these errors.

Category II

There were 8 number pairs judged to be included in this category.

	Test # read	Test # heard		Test # read	Test # heard
1.	90	19	5.	15	16
2.	16	60	6.	17	70
3.	50	15	7.	50	15
4.	15	16	8.	15	16

The "ty" and "teen" endings are similar in the manner of production and in the tonal frequency components.

Category III

There were 31 number pairs judged to be in this category.

	Test # read	Test # heard		Test # read	Test # heard
1.	21	20	17.	95	90
2.	83	80	18.	73	33
3.	33	3	19.	77	70
4.	52	2	20.	28	8
5.	90	9	21.	87	7
6.	44	40	22.	74	4
7.	55	5	23.	32	2
8.	60	68	24.	80	8
9.	99	9	25.	41	4
10.	77	17	26.	33	3
11.	43	40	27.	47	7
12.	39	30	28.	39	9
13.	30	3	29.	65	5
14.	44	4	30.	3	30
15.	64	66	31.	60	61
16.	90	9			

The majority of the errors in this category are simply a result of a part of the number being omitted (usually the last digit). It is common for individuals to lower their voice at the end of a phrase. It is possibly this effect that is the reason for so many errors in this category. It is also possible that the transmission was clipped due to the operator releasing the transmit button before the phrase is completed. This would only effect the last number in the series, however; it is unknown where the errors occurred in the number series.

There are many factors that influence a listener's perception of words, especially numerical combinations. These factors can include dialectal variations, speaking rate, hearing acuity, operator error, and the degradation of a signal due to a standard audio (radio, telephone, etc.) transmission. Number sequences are commonly misheard due to the high frequency component (i.e. /s/, /f/, /v/, /x/, /t/) in the spoken numerals. A simple way to reduce the number of errors would be to have the speakers use single digits to represent the number combinations ("2" "4" to represent the number 24). The use of single digits will provide less opportunity for error and single spoken digits, in general, are composed of lower frequency components (more vowels), resulting in improved comprehension.

If you have any questions or comments about this report, please do not hesitate to give me a call.

Larry Burse, M.S./CCC-A
Clinical Audiologist

800 MHz TRUNKED DIGITAL SIMULCAST RADIO SYSTEM, DIGITAL MULTIPLEX, TOWER, SHELTER, AND SERVICES FOR CITY OF MIAMI BEACH, FLORIDA

INSTRUCTIONS TO PROPOSERS

Technical Proposals with Sealed bids will be received by the City of Miami Beach Procurement Division, 3rd Floor, 1700 Convention Center Drive, Miami Beach, Florida 33139, until 3:00 p.m. on the 27th day of March, 2002 for:

800 MHz TRUNKED DIGITAL SIMULCAST RADIO SYSTEM, DIGITAL MULTIPLEX, TOWER, SHELTER, AND SERVICES FOR CITY OF MIAMI BEACH, FLORIDA

At time, date, and place above, Technical Proposals will be publicly opened, and Sealed Bids will remain sealed until such time when Technical Proposals have been evaluated. Please be advised that the City has implemented enhanced security measures and as a result you must present a photo identification card (i.e. driver's license) before entering our City Hall building. Bidders may expect delays up to 30 minutes, and should therefore plan accordingly in giving themselves enough time to deliver bid/proposal by the due date and time as specified herein. Any bids or proposals received after time and date specified will be returned to the bidder unopened. The responsibility for submitting a bid/proposal before the stated time and date is solely and strictly the responsibility of the bidder/proposer. The city is not responsible for delays caused by mail, courier service, including U.S. Mail, or any other occurrence.

Any questions or clarifications concerning this Bid shall be submitted in writing by mail or facsimile to the Procurement Division, 1700 Convention Center Drive, Miami Beach, FL 33139, or FAX: (305) 673-7851. The Bid title/number shall be referenced on all correspondence.

All questions must be received no later than 10 calendar days prior to the scheduled Bid opening date. All responses to questions/clarifications will be sent to all prospective bidders in the form of an addendum.

Mail, E-Mail, Fax or deliver all technical questions to:

City of Miami Beach
Procurement Division, 3rd Floor,
1700 Convention Center Drive,
Miami Beach, Florida 33139
Attention: Mr. Gus Lopez
(305)-673-7851 fax
guslopez@ci.miami-beach.fl.us

The City of Miami Beach reserves the right to accept any proposal or bid deemed to be in the best interest of the City of Miami Beach, or waive any informality in any proposal or bid. The City of Miami Beach may reject any and all proposals or bids.

1.1 SEALED BIDS:

An original plus three copies of the Technical Proposal and sealed Bid as well as any other pertinent documents must be returned in order for the bid to be considered for award. All bids are subject to the conditions specified hereon and on the attached Addendum, Special Conditions, Specifications and Bid Form.

The completed price bid must be submitted in a sealed envelope clearly and boldly marked with the Bid Title to the City of Miami Beach Procurement Division, 3rd floor, 1700 Convention Center Drive, Miami Beach, Florida 33139. Facsimile bids will not be accepted.

1.2 EXECUTION OF BID:

Bid must contain a manual signature of an authorized representative in the space provided on the Bid Form. Failure to properly sign bid shall invalidate same and it shall NOT be considered for award. All bids must be completed in pen and ink or typewritten. No erasures are permitted. If a correction is necessary, draw a single line through the entered figure and enter the corrected figure above it. Corrections must be initialed by the person signing the bid. Any illegible entries, pencil bids or corrections not initialed will not be tabulated. The original bid conditions and specifications CANNOT be changed or altered in any way. Altered bids will not be considered. Clarification of bid submitted shall be in letter form, signed by bidders and attached to the bid.

1.4 PRICES QUOTED:

Deduct trade discounts and quote firm net prices. Give both unit price and extended total, when requested. Prices must be stated in units of quantity specified in the bidding specifications. In case of discrepancy in computing the amount of the bid, the UNIT PRICE quoted will govern. All prices must be F.O.B. destination, freight prepaid (unless otherwise stated in special conditions). Discounts for prompt payment. Award, if made, will be in accordance with terms and conditions stated herein. Each item must be bid separately and no attempt is to be made to tie any item or items in with any other item or items. Cash or quantity discounts offered will not be a consideration in determination of award of bid(s).

The following conditions apply to the Statement of Work (SOW) and shall comprise Addendum 1 to the SOW:

ADDENDUM 1
800 MHz TRUNKED DIGITAL SIMULCAST RADIO SYSTEM, DIGITAL MULTIPLEX, TOWER, SHELTER, AND SERVICES FOR CITY OF MIAMI BEACH, FLORIDA

1. SOW Technical Response Proposal

   Proposals must contain a point-by-point response to the SOW indicating the materials, procedures and resources to be used in fulfilling the SOW requirements.

   A digital copy of the SOW (revised November 16, 2001 and re-issued electronically on February 13, 2002) is available and proposers are encouraged to incorporate it's text within their proposal provided the SOW text is not modified from the printed version of the SOW.

   Using the format of the Compliance Matrix in Attachment A, provide a cross reference to the applicable paragraphs within the SOW response. Indicate Yes or No compliance for each section of the SOW. If a No is indicated, provide explanation as to the reason for non-compliance.

   Include in your proposal a detailed list of all equipment to be provided using Excel spreadsheet format.

   Submission of a proposal shall indicate acceptance of the terms of the SOW and this Addendum.

2. Price Proposal (Bid)

   The Price proposal shall be delivered in a clearly identifiable sealed envelope accompanying the technical response. The Pricing Summary format in Attachment B shall be utilized for the Price Proposal. Additionally a corresponding detailed equipment list (following the format provided with the technical response) with the addition of itemized cost for all items and related services must be provided with the sealed cost proposal. A "soft" copy of all pricing data shall be provided in Microsoft Excel format. Prices quoted shall be valid for 120 days from submittal.

3. Outright Purchase

   Only one proposal may be submitted by each proposer. Proposals shall be constructed to present costs for outright purchase of the system. Alternative proposals will not be entertained.

4. Turnkey System

   Proposals shall be "turn key" and shall include all hardware, software and services required to implement the system. User quantities shall be complete and accurate. If an upgrade to the existing SmartNet system is proposed, and under such a proposal, the existing subscriber equipment is to be retained by the City, any additional portable, mobile or control station quantities required to fully implement digital public safety dispatch operations shall be included in the price proposal.

5. Latest Technology

The hardware, firmware and software provided under this procurement shall be the latest versions commercially available. No products for which "intent to cancel" has been published or for which discontinuation has been forecast are to be proposed. New mobile and portable equipment shall be required to be serviceable with replacement parts available for 7 years and fixed system equipment shall be required to be serviceable with replacement parts available for 10 years from system acceptance.

If existing subscriber equipment is to be utilized, such equipment shall be upgraded to latest versions of software and/or firmware and any outstanding performance-affecting service bulletins shall be performed.

6. Coverage Maps

Coverage maps depicting coverage in compliance with the SOW parameters and requirements shall be submitted with the proposal. The proposed coverage maps shall become an exhibit in any resulting contract and shall not be modified unless the City subsequently modifies the locations or parameters of the antenna sites.

The system license has been modified to reflect the SOW design and has been submitted to the FCC for approval. Proposers are reminded to submit coverage maps consistent with the parameters of the license modification. However, provided that the coverage requirements of the SOW are maintained. Proposers may reasonably modify antenna gain and utilize down-tilt if they feel improved in-building coverage may result. However, base station power output is to remain at a nominal 100 watts. Proposals, which utilize arbitrarily reduced or attenuated transmitter power output parameters may be disqualified as being non-compliant.

The City is also concerned with wind survivability of the antennas and will entertain models, which provide improved high wind speed survival.

7. Coverage Acceptance Testing

Coverage testing shall comply with the requirements of the SOW. As clarification it should be stressed that testing shall be performed and evaluated only within locations (Grids) <u>on land within the jurisdiction</u> of the City of Miami Beach.

8. Thirty (30) Day Performance Test

Following system and coverage acceptance testing, and upon notice from the contractor that the system is ready for its intended use, the system shall be utilized for public safety digital dispatch. To accomplish this, police and fire digital subscriber equipment must be operational in substantial quantities such that all users and dispatchers are utilizing digital equipment and digital talk-groups. The use of the system for such performance testing shall not constitute system acceptance.

9. Continuity of SmartNet and Microwave Maintenance

The City is under contract with Motorola until September 30, 2002. The contract provides for 24/7 response on most fixed equipment including the Harris microwave system. A qualified maintenance technician is on-site 40 hours per week. A response time of 2 hours with restoration of service within 4 hours is provided within the contract. Repair of non-fixed equipment including control stations is provided 9-5 Monday through Friday. (See Attachment C for details of the inventory).

It should be noted that some of the fixed system equipment, primarily the MICOR repeaters and satellite receivers are no longer supported with respect to parts. The City is aware of this and is agreeable to the substitution of used parts from secondary market if required. Many assemblies such as controller modules are repairable only at the Depot level. The current Motorola service contract provides for Depot repair where required.

The successful contractor will be responsible for the continuation of this service agreement until it's expiration. The City will continue to pay Motorola until that date, however the contractor will be required to coordinate all installation and cutover activities with the City and Motorola, and shall be responsible for any above contract costs and risks associated with their activities related to the installation and cut-over of the new system.

Upon the September 30, 2002 expiration of the Motorola service contract, the Contractor shall provide continuation of the SmartNet and Harris microwave maintenance until the new system is successfully cutover. The Contractor must include the cost to extend this service in their proposal. The Contractor may elect to provide this service himself, provided that the level of service is equivalent.

Radio units not listed in the service agreement are currently under 2-year warranty. As the warranty for those units expire, the City may elect for these radios to be added to the service agreement under a change order.

The costs to service the microwave system during the one-year system warranty shall be included in the proposal. The Contractor shall provide a single point of contact and shall be responsible for all maintenance issues related to the radio system and the microwave system.

10. Cost For Optional Maintenance after Warranty: Years 2 through 6

The Contractor shall propose costs to continue to provide services to maintain the radio system in its entirety. The costs to service the microwave system shall be included in the proposal to service the system in subsequent years. The Contractor shall provide a single point of contact and shall be responsibility for all maintenance issues related to the radio system and the microwave system.

Fixed equipment (excluding RF control stations) shall be serviced 24 hours per day 7 days per week. All service requests for fixed equipment shall be via a 24-hour call center. Response time from initiation of trouble call until a technician is on site shall be no longer than 2 hours. Time to repair in the event of Major failures (as defined in SOW) shall be no longer than 4 hours except where beyond the control of the Contractor.

A qualified radio maintenance technician shall be dedicated to the City and available on site 40 hours per week to perform routine preventative maintenance tasks, assist in producing

reports, perform equipment repairs, programming and other radio system related tasks as directed by the City.

Portable, mobile and control station repairs shall be facilitated 9:00 AM to 5:00 PM Monday through Friday. Repair of subscriber equipment shall be completed within 96 hours, 95% of the time.

11. Performance Bond

The Contractor shall furnish a performance bond in the amount of the Contract as security for the faithful performance of the Contract and the payment of all obligations there under. The Contractor shall furnish the bond at the time of the execution of the Contract as security for the faithful performance of the Contract and for the payment of all persons performing labor and furnishing materials in connection with the Contract. A surety company authorized to do business in the State of Florida shall execute all bonds and the Contract instrument or bond must be countersigned by a duly licensed Florida resident agency representing the company. The Contractor shall pay the premiums.

12. Delivery, Installation And Project Schedule

The Contractor shall deliver all equipment and successfully accomplish all installations and testing within 365 consecutive calendar days after date of issuance of the Notice to Proceed unless a later schedule is specifically agreed to by the Purchaser.

The Proposer shall submit a project schedule using the Critical Path Method (CPM) within the Technical Proposal. The schedule shall delineate the length of time requested to complete the project, the schedule of components, and the sequence of work, with major tasks and milestones to be accomplished clearly identified.

13. Liquidated Damages

If the Contractor fails to deliver and install the equipment in accordance with the contract, it is understood and the Contractor hereby agrees, that the amount of $1000.00 per day, for a period of up to 90 days shall be deducted from the monies due the Contractor for each intervening calendar day any work remains incomplete, not as a penalty, but as liquidated damages. Except the Contractor shall not be liable if failure to perform arises out of causes beyond the reasonable control of the Contractor and without the fault or negligence of the Contractor (acts of God, the public enemy, fires, floods, strikes, freight embargoes, etc.). After 90 days the Purchaser reserves the right to enforce the provisions of the performance bond or continue the $1000.00 per day liquidated damages.

14. Reservation of Rights

Upon selection of the proposer whose offering is determined by the City to be most acceptable for award, the City retains the right to negotiate any and all contract terms and conditions prior to making an award. Failure of the parties to reach a mutual agreement, the City retains the right to negotiate with the next acceptable proposer, advertise and solicit new proposals, or take no other action.

15. Bidder Certification

Please sign and date this addendum No. 1 and include it with the compliance matrix in your technical proposal package.

Read and agreed.

Signature: _____ Date: _____
Print/ Type Name: _____ Title: _____
Name of Firm: _____

ATTACHMENT A
COMPLIANCE MATRIX

STATEMENT OF WORK					
ITEM #	SOW SECTION REFERENCE AND/OR DESCRIPTION		Comply? Yes or No?	If no, explain.	Reference Section of Proposal
1	**1.0**	**Statement of Work**			
2	1.1	System upgrade and cutover			
3	1.2	Digital Voice Technology			
4	1.3	Dispatch Facilities			
5	1.4	Simulcast System			
6	1.5	RF Coverage			
7	1.6	RF Interference Environment Evaluation			
8	1.7	Standards and Regulations			
9	1.8	Required Services			
10	1.8.1	Excluded Services			
11	1.9	Workmanship			
12	1.9.1	Factory Staging			
13	1.9.2	Cutover Plan			
14	1.9.3	Installation Coordination			
15	1.10	Equipment Removal			
16	1.11	Site Restoration			
17	1.12	Spares			
18	1.13	Sites of Work			
19	1.13.1	Rebecca Tower			
20	1.13.2	Old City Hall			
21	1.13.3	Police Department			
22	1.13.3.1	Police and Fire Dispatch Center			
23	1.13.3.2	Dispatch Center Equipment Room			
24	1.13.4	New City Hall			
25	1.13.5	Fire Station 2			
26	1.13.6	Tower 41			
27	1.13.7	LaGorce Palace			
28	1.13.8	75th Street			
29	1.13.8.1	250 Foot PIROD Tower			
30	1.13.8.2	VFP Precast Concrete Shelter			
31	1.13.8.3	ONAN Diesel Generator			
32	1.13.8.4	75th Street Simulcast			
33	1.13.9	Microwave Mux and Channel Expansion			
34	1.14	Other Services			
35	1.14.1	Control Station Installations			
36	1.14.2	Mobile Radio Installations			
37	1.14.3	Portable Radio Deployment			
38	1.14.4	Training			
39	**2.0**	**System Description**			
40	2.1	System Configuration			

ITEM #	SOW SECTION REFERENCE AND/OR DESCRIPTION		Comply? Yes or No?	If no, explain.	Reference Section of Proposal
41	2.2	Trunking Requirements			
42	2.2.1	Channel Priority			
43	2.2.2	User Group Organizational Structure			
44	2.2.3	Addressing and Signaling			
45	2.2.4	System Access Time			
46	2.2.5	Private Conversation			
47	2.2.6	Selective Alerting			
48	2.2.7	On-Channel Interference			
49	2.2.8	Out of Range (Contact) Indication			
50	2.2.9	Unit Disable			
51	2.2.10	Unit Identification (ID)			
52	2.2.11	Automatic Station ID			
53	2.2.12	Dynamic Regrouping			
54	2.2.13	Trunking Protocol			
55	2.2.14	System/Site Controller			
56	2.2.15	System Manager			
57	2.2.16	Database			
58	2.2.16.1	System Diagnostics			
59	2.2.16.2	System Alarms			
60	2.2.16.3	Report Generation			
61	2.2.16.4	Activity Reports			
62	2.2.16.5	System Manager Terminal			
63	2.2.17	Digital Voice Encryption			
64	2.2.18	Reliability/Redundancy/Backup			
65	2.2.18.1	Failure Mode One (Single Point Failure)			
66	2.2.18.2	Failure Mode Two (Multiple Point Failures)			
67	2.2.18.3	Other Reliability Requirements			
68	2.2.19	System Alignment/Diagnostics/Test Equipment			
69	2.2.19.1	System Alignment/Optimization			
70	2.2.19.2	Alignment Test Equipment			
71	2.2.19.3	Spare Parts Inventory			
72	2.3	Channelization			

ITEM #	SOW SECTION REFERENCE AND/OR DESCRIPTION		Comply? Yes or No?	If no, explain.	Reference Section of Proposal
73	**3.0**	**Performance Verification**			
74	3.1	General			
75	3.2	System Acceptance Test Plan			
76	3.3	Radio System			
77	3.3.1	Equipment/System Tests			
78	3.3.2	Functional Tests			
79	3.4	Radio Communications Coverage			
80	3.4.1	Coverage Reliability			
81	3.4.2	Received Signal and Circuit Merit			
82	3.4.3	Simulcast Coverage Performance Prediction			
83	3.4.4	System Configuration/Antenna Sites			
84	3.4.5	Equipment Parameters			
85	3.4.5.1	General Parameters Subscriber Equipment			
86	3.4.6	Antenna Site Equipment Parameters			
87	3.4.7	Mobile Radio Configuration			
88	3.4.8	Portable Radio Configuration			
89	3.4.9	Inside Building and On-Street Coverage			
90	3.4.10	Coverage in Specific Buildings			
91	3.4.11	Coverage Acceptance Test Plan			
92	3.4.12	Coverage Testing Methodology			
93	3.4.13	Prerequisites and Preparation			
94	3.4.14	Analyzing Data and Report Generation			
95	3.4.15	Manual Delivered Audio Quality (DAQ) Test			
96	3.4.16	Coverage Performance Guarantee			
97	3.4.17	Test Location			
98	3.4.18	Test Methodology			
99	3.4.19	Thirty-Day Test Plan			
100	3.4.19.1	Purpose			
101	3.4.19.2	General			
102	3.4.19.3	Service Support			
103	3.4.19.4	Classification of Failures			
104	3.4.19.4.1	Minor			
105	3.4.19.4.2	Trunking System (Minor)			
106	3.4.19.4.3	Microwave and Multiplex System (Minor)			
107	3.4.19.4.4	Network Monitoring and Alarm System (Minor)			
108	3.4.19.5	Major			
109	3.4.19.5.1	Trunking System (Major)			
110	3.4.19.5.2	Microwave and Multiplex System (Major)			
111	3.4.19.5.3	Network Monitoring and Alarm System (Major)			
112	3.4.19.6	Report Generation			
113	3.4.19.7	Exclusions			
114	APPNDX A	Subscriber Equipment Requirements			

ATTACHMENT B
PRICING SUMMARY FORMS

ADDENDUM 1
800 MHz TRUNKED DIGITAL SIMULCAST RADIO SYSTEM, DIGITAL MULTIPLEX, TOWER, SHELTER, AND SERVICES FOR CITY OF MIAMI BEACH, FLORIDA

PRICING SUMMARY	
SYSTEM BACKBONE EQUIPMENT	
Rebecca Tower Receive Only Site	
Old City Hall	
Fire Station 2 Simulcast Transmit-Receive Site	
Police Department Dispatch Room	
Police Department Equipment Room	
41st Street (Tower 41) Simulcast Transmit-Receive Site	
75th Street Reservoir Simulcast Transmit-Receive Site	
Services	
Training for System Manager and Users	
Other	
System Subtotal	
FACILITIES, TOWER AND CIVILS	
Rebecca Tower Receive Only Site	
Old City Hall	
Fire Station 2 Simulcast Transmit-Receive Site	
Police Department Dispatch Room	
Police Department Equipment Room	
New City Hall	
41st Street (Tower 41) Simulcast Transmit-Receive Site	
75th Street Reservoir Simulcast Transmit-Receive Site	
LaGorce Palace (Remove equipment and restore Site)	
Other	
Facilities, Tower and Civils Subtotal	
CRITICAL BUILDINGS (BDA's)	
Mt. Sinai Hospital	
South Shore Hospital	
Police Headquarters	
Critical Buildings Subtotal	
USER EQUIPMENT (From Appendix A of SOW)	
PROGRAMMING SOFTWARE AND REQUIRED ACCESSORIES	
ESSENTIAL SYSTEM SPARES	
KEY VARIABLE LOADER FOR ENCRYPTION WITH REQUIRED ACCESSORIES	
1 YEAR WARRANTY MAINTENANCE INCLUDING MICROWAVE BACKBONE	
SYSTEM TOTAL	

ADDENDUM 1
800 MHz TRUNKED DIGITAL SIMULCAST RADIO SYSTEM, DIGITAL MULTIPLEX, TOWER, SHELTER, AND SERVICES FOR CITY OF MIAMI BEACH, FLORIDA

MAINTENANCE SERVICE SUBSEQUENT TO WARRANTY YEAR BASED ON CONTRACT QUANTITIES	
System Maintenance Year 2 (Including Microwave Backbone)	
System Maintenance Year 3 (Including Microwave Backbone)	
System Maintenance Year 4 (Including Microwave Backbone)	
System Maintenance Year 5 (Including Microwave Backbone)	
System Maintenance Year 6 (Including Microwave Backbone)	
SUBSCRIBER MAINTENANCE YEAR 2	
SUBSCRIBER MAINTENANCE YEAR 3	
SUBSCRIBER MAINTENANCE YEAR 4	
SUBSCRIBER MAINTENANCE YEAR 5	
SUBSCRIBER MAINTENANCE YEAR 6	
TOTAL FIVE YEARS MAINTENANCE SERVICE	

OPTIONAL EQUIPMENT PRICING	
Dispatch Console Position # 9 (installed)	
Dispatch Console Position #10 (installed)	
Dispatch Console Position #11 (installed)	
Dispatch Console Position #12 (installed)	
Remote Dispatch Option per Console (installed)	
Additional Back-up RF Control per Console (installed)	
Quantity 40 Plantronics Supra Headsets	
Five Ton Air-conditioning Unit for FS 2 Site (installed)	
FM200 Fire Protection System for 75th Street Site (installed)	
Three Channel Centralized Telephone Interconnect (installed)	

OPTIONAL SPARES (LIST ESSENTIAL SPARES WITH SYSTEM COST)	

ATTACHMENT C

MAINTENANCE OF EXISTING SYSTEM

ADDENDUM 1
800 MHz TRUNKED DIGITAL SIMULCAST RADIO SYSTEM, DIGITAL MULTIPLEX, TOWER, SHELTER, AND SERVICES FOR CITY OF MIAMI BEACH, FLORIDA

Qty	Description	Response Required
LOT	Smartnet trunked system consisting of 10 channels; two transmit/receiver sites (main and backup non-simulcast), two receive only sites, redundant 10-channel 4-site SpectraTac voting subsystems, redundant SmartNet controllers. Centracom console CEB with 7 remote operator positions, 4 UPS units, and 40-track logging recorder interface.	24 hours 7 day with two-hour response and four hour restoration of service. A Smartnet qualified on-site maintenance technician is dedicated to City 40 hours per week. Service calls are initiated via a Call Center which provides factory technical support and if necessary, escalation of support response.
LOT	HARRIS DVM10-XT HSWO digital microwave system consisting of: 2 terminals and 4 repeaters, 6 multiplexers, 9 Premisys channel banks, LOT T1 and 4 wire interfaces, 6 battery banks and chargers, Andrew dehydrators, 2 (redundant) FARSCAN (Windows) alarm terminals, 6 DVM's and 6 DVA's and 2 printers.	24 hours 7 day with two-hour response and four hour restoration of service. A Smartnet qualified on-site maintenance technician is dedicated to City 40 hours per week. Service calls are initiated via a Call Center which provides factory technical support and if necessary, escalation of support response.
LOT	Site associated hardware including: 6 smoke detectors, 1 bi-directional amplifier (Byron Hall).	9:00 AM to 5:00 PM M-F On Site service.
9	RF Control Stations, 1 with remote control.	9:00 AM to 5:00 PM M-F On Site service.
LOT	DARCOM 900 MHz Link Consisting of one DARCOM duplex radio, Cetec-Vega status tone shelf, BIM module, batteries and charger. This link spans between the CAB building in Miami and Fire Station 2. Used to link one common talk-path between COM and CMB.	9:00 AM to 5:00 PM M-F On Site service.
412	MTS2000 Portable Radios and chargers	9:00 AM to 5:00 PM M-F Pick up and delivery provided.
480	ASTRO XTS3000 Portable Radios and chargers	9:00 AM to 5:00 PM M-F Pick up and delivery provided.
20	Encrypted ASTRO XTS3000 Portable Radios and chargers	9:00 AM to 5:00 PM M-F Pick up and delivery provided.
2	SecureNet KVL encryption key variable key loaders	9:00 AM to 5:00 PM M-F Pick up and delivery provided.
21	SPECTRA Motorcycle Mobiles	9:00 AM to 5:00 PM M-F On Site service.
10	SPECTRA Mobiles	9:00 AM to 5:00 PM M-F On Site service.
45	Motorola Sirens	9:00 AM to 5:00 PM M-F On Site service.

ADDENDUM 2
800 MHz TRUNKED DIGITAL SIMULCAST RADIO SYSTEM, DIGITAL MULTIPLEX, TOWER, SHELTER, AND SERVICES FOR CITY OF MIAMI BEACH, FLORIDA

Questions from Motorola Received on March 12, 2002.

1. *What are the criteria by which the proposals will be evaluated, ranked and rated, and what are the weights assigned to each criterion?*
2. *Once the sealed price is opened, will the score be adjusted? If so, how?*

ANSWER:
The vendor's are to comply with each requirement of the SOW and any Addenda. A Compliance Matrix form has been provided with Addendum 1 for the vendor's to complete as a "self evaluation". Each Technical Response will be reviewed against the SOW to ensure compliance with the SOW. Each area of the SOW will be assessed per Table 1 below:

Table 1

	DEFINITION
Full Compliance: =3	Meets all specifications and Requirements as set forth in the SOW document.
Minor Exception: =2	The score awarded if the vendor 1) meets the SOW criterion, but 2) utilizes resources that differ cosmetically or functionally, and whose nature does not significantly affect performance as outlined in the SOW and to a lesser degree than that described for a Minor Non-conformance.
Minor Non-Conformance: = 1	The score awarded if the vendor 1) partially meets the SOW specification criteria for a particular category, and 2) utilizes an item(s) whose performance can affect the performance of the item(s) or of the system as a whole. This score should reflect, to a lesser degree than for a Major Non-Conformance, possible variances within the SOW specification or requirement criteria.
Major Non-Conformance: =0	The score given if a vendor fails to meet any of the SOW criteria for a particular category. For example, this score would be given to the vendor that utilizes an item(s) that will significantly affect the performance of the item(s) or of the system as a whole, where in the opinion of RCC, the utilization of such resources fails to conform to any of the acceptable criteria as set forth in the SOW.

RCC will review each Technical Response for compliance with the SOW. Any item receiving a score of 1 or 0 will be assessed for it's actual impact on the project with respect to technical and/or financial risk to the City. RCC will present a report on each Technical Response to the City with our recommendation as to each submittal's compliance with the SOW. If both Vendors' Technical Responses are compliant with the SOW, both price proposals will be opened and the low bid will prevail. If a vendor's Technical Response is not compliant, its bid will be rejected, and the award may be made to the bidder whose Technical Response is compliant. There will not be any weighting of technical points versus cost.

Please see Sections 2-369 and 2-370 of the City of Miami Beach Procurement Code below:

Sec. 2-369. Award of contract.
All contracts, when the sum is $10,000.00 or less, shall be awarded by the procurement director to

the lowest and best bidder. All contracts, when the sum is in excess of $10,000.00 and not exceeding $25,000.00 shall be awarded by the city manager, or his designee, to the lowest and best bidder. When the amount of a contract is in excess of $25,000.00, the city commission shall award the contract to the lowest and best bidder, or may delegate to the city manager the power to award such contract to the lowest and best bidder; however, the purchase of commodities, materials, supplies or other
items on a continuing basis from Metropolitan Dade County or state or federal general services administration bid list may be approved by the city manager without any action by the city commission, even though the total cost of such commodities, materials, supplies or other items may exceed $25,000.00 over a one-year period. In determining the lowest and best bidder, in addition to price, there shall be considered the following:

1. The ability, capacity and skill of the bidder to perform the contract.
2. Whether the bidder can perform the contract within the time specified, without delay or interference.
3. The character, integrity, reputation, judgment, experience and efficiency of the bidder.
4. The quality of performance of previous contracts.
5. The previous and existing compliance by the bidder with laws and ordinances relating to the contract.

(Code 1964, §§ 31A-12, 31A-19; Ord. No. 2001-3290, § 1, 1-31-01)

Sec. 2-370. Award of contract to other than low bidder.

(a) When a contract award is not given to the lowest bidder, a full and complete statement of the reasons for placing the order elsewhere shall be prepared by the procurement director, included in the minutes typed on the tabulation sheet, which must be signed by the procurement director and filed with the other papers relating to the transaction.

(b) Award of all tie bids of $10,000.00 value or less shall be made by the procurement director. All tie bids in excess of $10,000.00 but not exceeding $25,000.00 shall be awarded by the city manager or his designee.

(Code 1964, §§ 31A-13, 31A-19; Ord. No. 2001-3290, § 1, 1-31-01)

3. 1.13.1 Rebecca Tower (Receive Only Site)
Do the modular plug patch panels supplied by Motorola's CCSI meet the jack field requirements?

ANSWER:
Rack mounted modular plug patch panels are an acceptable alternative to bantam jack fields for audio, DS0 and lower data requirements. For DS1 requirements, vendors are to provide bantam jack fields. The multiplex racks presently are equipped with ADC Mini-DSX 8 termination chassis and modules and these may be further expanded or complemented with the same model. See section 2.2.19 of SOW.

4. 1.13.3.2. Dispatch Equipment Room (Control Point)

Motorola uses a DSA and test receivers to optimize the simulcast system. Is this acceptable?

Clarification was provided March 15th as follows: *I have attached a web site and a pdf. file describing the DSA. <<5966-3063E.pdf>>Agilent 35670A Dynamic Signal Analyser*

ANSWER: Yes

5. 1.13.2 Old City Hall

Is the dark fiber reference a mixed mode type fiber cable with ST connectors without active equipment?

ANSWER:

As there is presently no fiber optic cable between the PD and Old City Hall, the requirements for the cable type (multi-mode vs. single mode) and termination (ST, SC etc.) are up to the Vendor. The City will provide and install the appropriate cable and termination. The cable provided will be "dark"; the Vendor will be responsible for the light-wave to T1 electronics.

6. 3.4.9 Inside Building and On-Street Coverage

Are the definitions stated properly in this section?

Motorola's coverage prediction is based on clutter losses up to a given value, not greater than.

Heavy Buildings: Large downtown buildings, large commercial buildings, condominiums, hotels and large enclosed shopping malls. (four stories or more) Loss is typically 18 dB or more. Shouldn't it read 18db or less?

Medium Buildings: Small to medium size stores, small apartment buildings, small to medium size factories and small to medium size office buildings. (less than four stories) Loss is typically 11 dB or more. Shouldn't it read 1l db or less?

Light Buildings: Residential buildings (one or two stories), and other small commercial buildings. Loss is typically 6 dB or more. Shouldn't it read 6 db or less?

ANSWER:
The signal margin requirement of the SOW is 18 dB. Therefore the Building Type Definitions are informational only. The values cited are subject to variations in standard deviation (4 to 6 dB) and thus may indeed exceed those cited. These are building penetration losses not building clutter losses.

7. 3.4.15 Manual Delivered Audio Quality (DAQ) Test

~~*The exterior signal strength for the CATP has been passed using the automated test package. The three side method of establishing the average exterior signal will most likely include a RF shadow from the subject building thus skewing the average readings downward. Would it be acceptable to use the same subjective methods on the exterior along the non RF shadowed building sides given the exterior test unit would have the appropriate attenuators to simulate the building/antenna losses?*~~

Clarification provided by Motorola on March 15th as follows:

Question reworded and expanded upon.

3.4.15 Manual Delivered Audio Quality (DAQ) Test

The exterior signal strength for coverage area has been passed using the automated test package so it is assumed the purpose of the manual DAQ is to find areas that do not meet the coverage criteria. Correct?

The three side method of establishing the average exterior signal will most likely include a RF shadow from the subject building thus skewing the average readings downward. Correct?

Would it be acceptable to use the same subjective methods on the exterior of the building using following methods?

- *The exterior test would be along the non RF shadowed sides of the building nominally 6-10 feet away.*
- *The exterior test unit (Mobile on a cart with fixed antenna) would have the appropriate attenuators to simulate the building/antenna losses.*
- *The testers would make a transmission every 5-10 feet.*

- *The number of missed words over the statically viable total number of words would be used to calculate the reliability on the outside of the building.*
- *If the exterior reliability is 97% or better then the building is deemed to have a loss greater than 18.0dB.*

ANSWER:
The SOW requires "at least three sides of the building (to be) tested (as far as practical limits allow)" There is nothing in the SOW precluding testing of non-shadowed sides of the building. However, to determine building penetration loss of a failed building, the SOW requires a signal strength measurement, not a voice measurement as described in your question.

8. 3.4.16 Coverage Performance Guarantee
This section appears to refer to both the auto and manual but is between items that seem directly related. Does this section only apply to the Manual CATP?

ANSWER:
This requirement applies to both the automated as well as manual tests. The automated tests serve to prove that the signal strength is sufficient to provide 18 dB building penetration throughout the City, while the manual tests prove that the delivered audio quality is DAQ 3.4.

9. *3.4.17 Test Location*

a. How many tested buildings in all?

b. How many buildings per grid?

c. How is the loss difference between a user standing in a building and a user in a vehicle going to be handled?

d. Are the large buildings the only type of structure to be selected for testing?

e. This section indicates only one location per building will be tested. Is this correct?

ANSWER:

a. 300 to 500
b. One per grid.
c. Vehicle testing will be performed on an exception basis is a suitable, accessible building does not exist in a grid. The vehicle loss is less than 18 dB. No adjustment will be required.
d. If a large building is not available in the grid, a smaller building will be tested.
e. Yes.

10. 3.4.18 Test Methodology

a. Since there is a well documented problem in understanding two digit numbers are commonly misunderstood, would it be acceptable to use the International Alphabet (by design easily understood) sequence of characters given at a rate of one second per character instead of the numbers?

Example: *Spoken as follows; Charley, Echo, Gulf, Zulu, Mike, November, Whisky, Oscar, Papa, Delta*
Copied as follows; C E G Z M N W O P D

b. This section calls for perfect reception of the test message to considered passing which is a 5.0 DAQ. What considerations are going to be given to adapt this subjective test to a 3.4 DAQ?

c. The definition of 3.4 DAQ has the phrase "Speech understandable with repetition only rarely required." What is the acceptable error rate in hard numbers?

ANSWER:

a. The International Phonetic Alphabet was developed for conveying communications under weak or garbled signal conditions. The procedure in the SOW reflects the typical usage of the radio system in conveying routine messages such as street addresses etc.

b. Nothing in this section calls for a "perfect reception". The requirements are for DAQ 3.4, which is defined as: "Speech understandable with repetition only rarely required. Some noise/distortion." To accommodate the rare repetition, the SOW procedure allows for a test location to be repeated once in the event of failure.

c. TSB-88 does not quantify this error rate. However from American Heritage Dictionary "Rarely" is defined:

ADVERB: "RARELY"

1. Not often; infrequently: "The truth is rarely pure and never simple" (Oscar Wilde).
2. In an unusual degree; exceptionally.
3. With uncommon excellence.

USAGE NOTE:

Strictly speaking, the use of ever after rarely and seldom is redundant; She rarely ever watches television adds nothing to She rarely watches television.
In an earlier survey a large majority of the Usage Panel found this construction unacceptable in formal writing. But ever has been used as an intensive with rarely for several hundred years, and the construction is common in informal contexts. By contrast, the constructions rarely (or seldom) if ever and rarely (or seldom) or never are perfectly acceptable: She rarely if ever watches television. She rarely or never watches television. See Usage Notes at hardly, redundancy.

11. 1.3 Dispatch Facilities

Are the 4 mutual aid control stations referenced in this section included in inventory spreadsheet provided?

Reference control stations listed on the inventory spreadsheet for Fire (4) and police (3). Are these standard mobile type control stations with external power supply or are they all self contained and if they are self contained do they need tone remote capability?

ANSWER:

The four (4) Mutual Aid control stations which are to be rack mounted and wired to the console via Conventional Interface are not reflected in Appendix A. For bid purposes, assume these to be 8-channel/mode tone controlled digital 800 MHz control stations with trunked and conventional capabilities.

12. 1.1.1 1.13.7 LaGorce Palace (Site to be Abandoned)

Will it be the responsibility of the City to meet all Building owner demands to repair any additional renovation to this site?

ANSWER:

It will be the responsibility of the City to restore the site in accordance with the lease. The Vendor is responsible to restore the site in accordance with the SOW. Any additional demands by the building owner are the responsibility of the City. If additional work is warranted, it will be handled through a change order.

13. 1.1.1 (?) 1.23.8 75th Street Facilities - Tower, Shelter, and Generator (Simulcast Site)

This location was selected as a potential tower site due to its northern end proximity in the cities Coverage area ,and the cities approval At the time of selection there were no other construction projects at that location.

Since then, a building has been constructed. If it is found that at the time of designing the site that it is in no longer viable or that additional cost will be incurred due to the additional building . What will be the Cities position on this .

ANSWER:
The City is unaware of any existing condition that would make the site unviable.

14. 1.1.1 (?) 1.13.8.1 75th Street Facilities - Tower, Shelter, and Generator (Simulcast Site)
Where is the 160 MPH spec being referenced from ? Is this the City/County SPEC ? Is there s EIA222

ANSWER:
The requirement comes from the City's desire for the tower to be survivable up to a Category 5 hurricane with the operational wind speed to be Category 3 hurricane (range 111 - 130 MPH). Thus the tower must withstand 160 MPH basic wind-speed and the microwave dish must survive and must maintain twist and sway at 115 MPH basic wind speed as mounted.

15. 3.4.19.5 Trunking System
Loss or failure of system controller configuration database.
What database ?

ANSWER:
Any configuration parameters other than the subscriber database parameters (Item G.). This includes such items as; fleet map or talkgroup assignments, channel resource assignments, permissions, affiliations, RF channel and connect tone designations, priority levels, emergency modes, timer and timeout parameters, grade of service, zones, sites, consoles, etc.

ADDENDUM 2
800 MHz TRUNKED DIGITAL SIMULCAST RADIO SYSTEM, DIGITAL MULTIPLEX, TOWER, SHELTER, AND SERVICES FOR CITY OF MIAMI BEACH, FLORIDA

Additional Questions from Motorola Received: March 15, 2002 6:48 AM

1. Page 2 of Addendum Section 1.1 SEALED BIDS:
a. There is reference to "Special Conditions" form. We did not find a form titled as such. Could you please send it or explain where it is?
b. Same section refers to "BID FORM". We did not find a form titled as such could you please send it. We want to make sure we are compliant.

ANSWER:
a. There is no "Special Conditions" form.
b. Addendum 1, Attachment B contains pricing summary forms for the bid. Although there is no signature block on the forms, be sure to sign and date the bottom of each form.

2. SOW Section 1.8 "Required Services" B.
Public Safety dispatch "facilities" including digital IMBE operation. Can we substitute the word "Equipment" for facilities?

ANSWER:
You may substitute "Equipment and Services" for facilities.

3. SOW Section 1.9.2 – Cutover Plan
Is this a conflict? 1st paragraph: "Cutover cannot be phased." 3rd paragraph: " The Contractor shall provide a phase implementation plan" Please explain?

ANSWER:
Please change the word "cannot" to "may".

4. SOW Section 1.13.7 (E) (Lagorce Palace - Site to be abandoned) -
"Restore equipment room to orginial condition..." Can we get that phrase deleted and just have the requirements stated? "Original Condition" may not mean the same thing to both parties.

ANSWER:
The Vendor is responsible to restore the site in accordance with the SOW. Any additional demands by the building owner are the responsibility of the City. If additional work is warranted, it will be handled through a change order.

ADDENDUM 2
800 MHz TRUNKED DIGITAL SIMULCAST RADIO SYSTEM, DIGITAL MULTIPLEX, TOWER, SHELTER, AND SERVICES FOR CITY OF MIAMI BEACH, FLORIDA

Question from M/A-COM March 12, 2002

1. We don't see a requirement for a bid bond, but wanted to make absolutely sure there isn't one and we missed it. Can you verify this please? Also, how long before we can get cost information on the City's current maintenance from ITD? We do need it before we can finish our bid. Thanks,

ANSWER:
No Bid Bond is required.

Questions from M/A-COM received on March 08, 2002.

1. M/A-COM would like to get a copy of the City's current radio maintenance contract. Specifically we are looking for the pricing information, listing of current spare equipment on hand, and who is the service provider (name of company, contact person and phone numbers).
2. Page 1, "Instructions To Proposers", fourth paragraph, last sentence. Reference to "Bid title/number", where is the bid number on the document?

ANSWER:
1. A copy is attached.
2. 2. There is no bid number. Be sure to clearly and boldly mark all submitted items with the title of the project: "800 MHz Trunked Digital Simulcast Radio System, Digital Multiplex, Tower, Shelter, And Services For The City Of Miami Beach FLORIDA".

3. Page 2, "Instructions To Proposers", Section 1.2 first sentence. Reference is made to a "manual signature" on "space provided on Bid Form." What exactly makes up the "Bid Form" and where is the signature block?

ANSWER:
Addendum 1, Attachment B contains pricing summary forms for the bid. Although there is no signature block on the forms, be sure to sign and date the bottom of each form.

4. In the Compliance Matrix, we are unclear as to when the "Reference Section of Proposal" must be filled in. Is it only when we have a "No" answer or is it requiredfor every item, regardless?

ANSWER:
In order to properly review the response, the reference section must be filled in regardless of whether an exception has been made.

Bidder Certification

Please sign and date this Addendum No. 2 and include it with the compliance matrix in your technical proposal package.

Read and agreed.

Signature: _____ Date: _____

Print/ Type Name: _____ Title: _____

Name of Firm: _____

Exhibit K Training

Exhibit K

Training

Training

Overview

Motorola's Worldwide Learning Services organization dedicates itself exclusively to offering the most comprehensive training available for Motorola's advanced radio equipment. We understand that your equipment is a highly sophisticated communications instrument, and as such, requires specialized training to fully realize the equipment's potential. Thus, you need quality training that only Motorola delivers for quality Motorola products.

Instructors

Motorola's Customer Training Center offers advanced training facilities, resources, and techniques to help you achieve the maximum potential from your communications investment. A successful training experience also requires expertise and dedication on the part of the instructor as well as the trainee. At Motorola, our technical instructors have extensive backgrounds in RF communications, microwave technology, telephony, digital logic and microprocessors, as well as computer science. Instructors' formal training varies from postgraduate degrees in occupational education and electronics to a variety of military instructor programs. Since continuing education is crucial to continued success, Motorola instructors receive more than 100 hours of training annually in communications technology and training techniques. Our close relationship with product design and development ensures current, accurate information for every product.

Efficiency

Using Motorola technology to its fullest will assist performance at every level of system operation. Over the life of your system, these efficiencies add up to large dollar amounts. Receiving the proper training increases your employees' efficiency in their use of the system.

Integration of Training

Motorola's Worldwide Learning Services organization is unmatched in their ability to deliver integrated training packages to virtually any type of client.

From sophisticated training need analysis to ongoing training throughout the life cycle of your product or system, Motorola's Worldwide Learning Services can help ensure that your investment in training today is an investment for your future.

Motorola Advantages

Transfer of Knowledge

Successful system implementation as well as ongoing system management and maintenance can be greatly enhanced by the careful transfer of knowledge from Motorola in-house experts to system managers, technicians, and end users.

Critical elements of knowledge transfer include knowledgeable instructors, well-designed courseware, lab activities, and system hardware and software that closely parallels your operating environment integrated with proper system documentation.

To understand your specific configuration and product features, there is a well-defined communication link between Worldwide Learning Services and Motorola's field personnel. This link keeps us apprised of any special issues that arise. Applying this approach allows us to provide tailored system manager, technician, dispatcher, and end user training.

Through careful Needs Analysis, we design and develop training that enables you to become self-reliant with your equipment. This training can take place at one of our training centers or at your location.

Quality of Instructors

A careful blending of background, experience and continuous training creates a grounded, intellectually stimulating, and accessible instructor that will professionally deliver your training. Understanding that, the instructor will generate a training environment where students feel empowered to learn.

You can be assured that your Motorola instructor utilizes the Needs Analysis of your product or system. The process also ensures that your instructor readily understands the equipment, fashioning a smooth and effective training event.

Quality of Material

Course material performs a vital role in the training process and in the transfer of knowledge to the job site. It is not enough for the material to look professional. Course curriculum follows a design philosophy that instructors adhere to during the training event. Good course materials are easy to use, well integrated into the course design.

Because Motorola follows research-driven instructional design methodology, our course materials are specifically designed for ease of use and effective transfer of knowledge to the job. Course curriculum can be tailored to reflect your individual product. We provide relevant documentation pertaining to your product during the training event.

Knowledge Retention

Following a training event, the knowledge learned can sometimes be lost in the transition to the operating environment. To maximize retention and transfer to the job, our instructional designers conduct task analyses to determine performance criteria as part of the Motorola design process.

Motorola's Worldwide Technical Education training methodology is based upon several key criteria:

- Course design is driven by an analysis of learner needs.
- Learning objectives are based upon what learners need to accomplish on the job.
- Our training strategies are based upon maximizing transfer of skills to the job, and retention/reuse of effective learning.

Motorola accommodates these criteria in the following ways:

- Course content is focused on how-to, rather than theory.
- Class discussions are application based.
- Training incorporates maximum hands-on lab opportunities.
- Integration of customer specific job aides into the classroom experience and the lab activities, as well as through video support.

Course design, based on these customer-driven performance objectives, has determined that task-driven courses provide better knowledge retention for the students. Because of the course design, students will maintain the knowledge taught and apply it for immediate results that will extend the life of your product.

Types of Training Available

Based upon our years of experience, we have determined that the following type(s) of training will best serve your needs for comprehensive training education.

Instructor Led

Our qualified instructor(s) will lead your students through the requested course tailored to your system. Maximal instructor-led lab time has been allocated to help educate students in specific and everyday occurrences of programming, maintenance, and troubleshooting associated with your product.

Train-the-Trainer

Our instructor delivers training to the designated members of your training staff. During the Train-the-Trainer event, we will utilize your familiar equipment to deliver training to your trainers, thus ensuring a smooth transfer of knowledge.

Resident Training

Students attend training conducted at one of our training centers. Because of the diverse customer-base that attend resident training, the equipment is modeled upon a standard configuration.

End-User Training

We also offer a separate program for your subscription users. The End-User Training program tailors all training material to exactly match your system and radios. We can provide the training or train your trainers to deliver training.

Self-Study

This option allows students to follow a Computer Based Training module on CD-ROM or other media that will enhance their skills on-site. This option can be used in conjunction with instructor-led courses.

Prerequisites

We strive to provide a training experience that exceeds your expectations. You can help us ensure a positive experience by reviewing prerequisite requirements that are designated in your training plan. Prerequisites provide critical foundation knowledge that will be built upon during your classroom training. As such, the instructor will not be able to cover content that is included in prerequisites so therefore it is ***imperative*** that you complete them. If not, your subsequent training class may not provide the desired learning results.

Course Descriptions

These course descriptions can also appear in the training roadmaps

In the process of assessing your training needs, Motorola has identified the following course(s) that are necessary to achieve your training goals. Attached below are descriptions for each training course, if available, included in this proposal.

Presented below are the standard course outlines. While the standard courses are encouraged, the class outline may be tailored for your quotation. Thus the outline(s) below may not exactly match your quoted class length and content.

Training Plan / Matrix – City of Miami Beach

COURSE	GROUP	NUMBER OF SESSIONS	DURATION (days)	LOCATION	DATE	NUMBER OF ATTENDEES
Spectra XTS3000	Technicians	1	5	Miami Beach, FL	TBD	1
Managing Your SmartZone System	System Managers	1	5	Miami Beach, FL	TBD	2
CENTRACOM Gold Alias Database Mgr. (ADM) & Admin	Supervisors	1	1	Miami Beach, FL	TBD	5
CENTRACOM Gold Elite Operator (2 Training Consoles)	Operators	6 (4 hour sessions)	3	Miami Beach, FL	TBD	25 (4 to 5 per session)
XTS3000 Portable ASTRO Spectra Mobile (Train-the-Trainer)	Trainers	1	1	Miami Beach, FL	TBD	5
Managing Your SmartZone System	Technicians	1	4.5	Schaumburg, IL	TBD	Priced Per Student
ASTRO XTS3000 Portable	Technicians	1	3.5	Schaumburg, IL	TBD	Priced Per Student
ASTRO Spectra Mobile	Technicians	1	3.5	Schaumburg, IL	TB D	Priced Per Student