

Special Sales Tax Citizens Review Committee Meeting Notice

Date: Thursday, November 7, 2019

Time: 6:00 P.M.

Location: City Hall Conference Room

Agenda

- Roll Call.
- Approve the 9-10-2019 minutes.
- Request from Police Department for Public Safety Sales Tax Expenditures
 - Agree that the expenditure of an amount not to exceed \$35,000.00 for:
 1. The purchase of 6 APX 4500 mobile radios for the fleet vehicles and;
 2. The purchase of 6 APX 4000 portable radios
 - Agree that the expenditure on an amount for software not to exceed \$7,504.18 for the following:
 1. Barracuda Mail Archiver Maintenance -This is support maintenance for the Barracuda Mail archiver that allows for long term storage and retrieval of e-mail traffic from the network. The renewal cost is \$576.36.
 2. Lexis Nexis (Previously Bair Software Support Renewal) This is renewal of the analytical software annual upgrade and support plan used by the Police Department Crime Analyst. The software is critical for the work done by the Crime Analyst. The software is complex and the technical support has been important for the past several years. The support plan from Lexis Nexis includes an annual product release and technical assistance. This renewal cost is \$993.82.
 3. StarWitness Support and Maintenance-In 2016 the Police Department purchased an updated interview system for criminal investigations. The software is proprietary to the product and maintenance is renewed on an annual basis. The support plan includes software and

maintenance including updates, releases, bug fixes, and technical support for StarWitness Interviewer and Field Interviewer. The cost of renewal is \$2289.00.

4. Yellow Dog Networks -One year hardware and software Maintenance for our Eversync 2700 backup array that provides redundancy for information kept on our servers. Total Cost -\$3,645.00

- Request for Transportation Sales Tax Expenditures
 - Agree that the expenditure of an amount not to exceed \$100,000.00 for the purchase of at least 700 tons of salt.
 - Agree that the expenditure of an amount not to exceed \$60,237.00 for KCATA Transit Services in Raytown.
- Next STOC Meeting-TBD
- Adjourn.

CITY OF RAYTOWN
Request for Committee Action

Date: November 7, 2019
To: Public Safety Sales Tax Oversight Committee
From: Communications Director Krista Rhodes

Action Requested: Approve the purchase of 6 APX 4500 mobile radios, 6 APX 4000 portable radios.

Recommendation: Recommend approval as submitted.

Analysis: The City of Raytown Police Department uses the Metropolitan Area Regional Radio System (MARRS) for daily operations and interoperability with other agencies within the Kansas City metro area. MARRS has specific requirements for operating on the system which must be met by all public safety agencies by December 31st 2020. To meet these requirements the Police Department is replacing the current Motorola XTS portable and XTL mobile radios with the APX models.

This is the fifth year of a five year plan to replace all of the radios in use by the Police Department. In FY 2019-20 the purchase of radio equipment was budgeted at a total cost of \$36,406.00. Motorola has a contracted sale price that will save the city funds on this budgeted item. I am requesting that the amount allocated for radio procurement be used in the following area:

- Purchase of 6 APX 4500 mobile radios for the fleet vehicles.
- Purchase of 6 APX 4000 portable radios.

The purchase of the radio equipment is through Motorola Solutions in the amount of \$34,438.20. This purchase will provide radios at a lower amount than was budgeted and complete the five year radio replacement plan. The remainder of the quoted amount \$702.00 for portable radio batteries (quote line 3) will come from the General Fund.

Total Cost – \$ 34,438.20

Account – Capital – 205.32.00.100.57000

Additional Reports Attached: Quote for radios from Motorola. APX 4500 and APX 4000 Spec Sheets.

CITY OF RAYTOWN
Request for Committee Action

Date: October 28th, 2019
To: Sales Tax Oversight Committee
From: Captain Candice Schwarz, Police Department

Action Requested: A finding from the Sales Tax Oversight Committee that the requested software, maintenance and IT equipment and parts for Police Department computer equipment meet the intent of the Public Safety Sales Tax.

Recommendation: Recommend approval as submitted.

Analysis: The Police Department's computer systems are vital to the operation of the Department. The software for these systems requires support maintenance from the assorted vendors. Without this support updates would not be made as needed and software failure could cause the systems to stop working and effectively shut down much of the Police Department operation.

Barracuda Mail Archiver Maintenance – This is support maintenance for the Barracuda Mail archiver that allows for long term storage and retrieval of e-mail traffic from the network. The renewal cost is \$576.36.

Lexis Nexis (Previously Bair Software Support Renewal) This is renewal of the analytical software annual upgrade and support plan used by the Police Department Crime Analyst. The software is critical for the work done by the Crime Analyst. The software is complex and the technical support has been important for the past several years. The support plan from Lexis Nexis includes an annual product release and technical assistance. This renewal cost is \$993.82.

StarWitness Support and Maintenance- In 2016 the Police Department purchased an updated interview system for criminal investigations. The software is proprietary to the product and maintenance is renewed on an annual basis. The support plan includes software and maintenance including updated, releases, bug fixes, and technical support for StarWitness Interviewer and Field Interviewer. The cost of renewal is \$2289.00

Yellow Dog Networks – One year hardware and software Maintenance for our Eversync 2700 backup array that provides redundancy for information kept on our servers. Total Cost – \$3,645.00

Total Request from PSST \$7504.18

Additional Reports Attached: Price Sheets and Specs

CITY OF RAYTOWN
Request for Committee Action

Date: November 7, 2019
To: Sales Tax Oversight Committee
From: Damon Hodges, City Administrator

Action Requested: Sales Tax Oversight Committee approval that the expense of Transportation Sales Tax funds for the purchase of at least 700 tons of road salt for 2019-20 winter operations.

Recommendation: Staff recommends approval as submitted.

Analysis: The Public Works Department held bid openings on Thursday, May 30, 2019. There were 5 responsive bidders. Independent Salt Company submitted the low bid for 700 tons of salt at \$61.75/ton resulting in a total bid amount of \$43,225.00.

The contract, approved by the Board of Aldermen on July 2, 2019, includes the option to purchase additional salt at the same unit price of \$61.75 through March 31, 2020. Staff recommends the purchase of 700 tons from Independent Salt Co. to be delivered prior to March 31, 2020 to replenish salt levels that are anticipated to be used through this winter season.

The purchase up to 1700 tons of additional salt from Independent Salt Co. prior to March 31, 2020.

Additionally, up to 1000 tons of additional salt may be purchased from the City of Kansas City through material transport as a back-up source of salt in the event of unseasonable levels of snowfall.

The Public Works Dept. has budgeted \$100,000 for salt in FY2020.

FY2018 Public Works spent \$50,835.40 on salt.

FY2019 Public Works spent \$108,518.31 on salt.

Alternatives: n/a

Budgetary Impact:

- Not Applicable
- Budgeted item with available funds
- Non-Budgeted item with available funds through prioritization
- Non-Budgeted item with additional funds requested

Fund: Transportation Sales Tax Fund
204-62-00-100-52300

Amount to Spend: Not to exceed \$100,000.00

Additional Reports Attached: Bid Tabulation from May 2019 Bids.

Bid Tabulation
2:00pm, Thursday May 30, 2019

2019-20 ROAD SALT PURCHASE



1.					
Independent Salt Co.					
	Description	Est. Qty.	Unit	Bid Unit Price	Bid Price
1.	Sodium Chloride	700	Ton	\$ 61.75	\$ 43,225.00

2.					
Central Salt LLC					
	Description	Est. Qty.	Unit	Bid Unit Price	Bid Price
1.	Sodium Chloride	700	Ton	\$ -	No Bid

3.					
Compass Minerals					
	Description	Est. Qty.	Unit	Bid Unit Price	Bid Price
1.	Sodium Chloride	700	Ton	\$ -	No Bid

4.					
Morton Salt					
	Description	Est. Qty.	Unit	Bid Unit Price	Bid Price
1.	Sodium Chloride	700	Ton	\$ -	No Bid

5.					
Cargill, Inc.					
	Description	Est. Qty.	Unit	Bid Unit Price	Bid Price
1.	Sodium Chloride	700	Ton	\$ -	No Bid



MDL Technology, LLC

PO Box 658

Liberty, MO 64069-0658

816-781-3006

Invoice

Date	Invoice #
10/24/2019	30120013

Bill To
Raytown Missouri Police Department 10000 E 59th Street Raytown, MO 64133

Ship To
Raytown Missouri Police Department 10000 E 59th Street Raytown, MO 64133

P.O. Number	Terms	Rep	Ship	Via	F.O.B.	Project
	Net 15		10/24/2019	UPS		

Quantity	Item Code	Description	Price Each	Amount
1	BMA150a-e1	Barracuda Mail Archiver Energize Update Renewal	576.36	576.36

Total	\$576.36
--------------	----------



October 22, 2019

Candice Schwarz
Raytown MO Police Department
Raytown, Missouri

Dear Captain Schwarz,

This letter is to confirm that your account will incur a 3% increase on August 1, 2020. Your current yearly rate is \$964.87. Your new yearly rate will be \$993.82.

Sincerely,

Wyatt Erwin
Customer Administrative Specialist
LexisNexis Risk Solutions



Product Quote

QUOTE 3144

Prepared for:

*Candice Schwarz
Raytown PD*

10000 E. 59th Street Raytown, MO 64133

Point of contact:

*Romina Quiroga
rominaq@signalscape.com*

10/21/2019

Submitted by:

Signalscape, Inc.
200 Regency Forest Drive
Suite 310
Cary, NC 27518
919-859-4565



Signalscape, Inc.
 200 Regency Forest Drive
 Suite 310
 Cary, NC 27518
 919-859-4565
 QUOTE: 3144
 10/21/2019

Name	Price	Qty	Subtotal
MINR.GSA - Support and Maintenance (1 yr) for Interviewer Software and maintenance including updates, releases, bug fixes, and technical support for StarWitness Interviewer. (Price will increase approximately 4% annually for all support and maintenance). TERM: 3/2/20-3/1/21	\$981.00	2	\$1,962.00
MINR-F.GSA - Support and Maintenance (1 yr) for Field Interviewer Software and maintenance including updates, releases, bug fixes, and technical support for StarWitness Field Interviewer. (Price will increase approximately 4% annually for all support and maintenance). TERM: 3/2/20-3/1/21	\$327.00	1	\$327.00
Subtotal			\$2,289.00
Tax 1 (0%)			\$0.00
Total			\$2,289.00

All sales subject to terms and conditions, downloadable at the following web link:
<https://s3.amazonaws.com/pandadocimages/Commercial+Terms+and+Conditions.pdf>

This quote is valid for 45 days from date of generation.
 GSA Number: GS-35F-0190M

Yellow Dog Networks

9664 Marion Ridge Drive
Kansas City, MO 64137



YELLOW DOG
Networks, Inc.

Unconditional Service

Quotation For:

Raytown Police Department

Customer Contact Information:

Name:	Candice Schwarz
Street Address:	10000 East 59th Street
City, State, Zip:	Raytown, MO 64133
Phone:	816-737-6105
Fax:	
Email:	Schwarzc@raytownpolice.org

Quote Valid:

Quote Date:

10/22/19

Quote Prepared by

Sales Person:	Jeff Thomas
Phone:	816-767-9364x121
Fax:	816-767-9365
Email:	jthomas@yellowdognetworks

Vendor	Part Number	Product Description	Qty	Sell	Ext. Sell
Infrascale		1 Year h/w & s/w Maintenance Eversync 2700 @ 12.0TB	1	\$3,645.00	\$3,645.00

Total

\$3,645.00

Contract dates 2/27/2020-2/27/2021

Terms: Net 30 Days

Notes:

Pricing Valid for 30 days

Freight costs included



RAYTOWN POLICE DEPT

Budgetary quote for APX4500 APX4000 Batteries

10/01/2019

10/01/2019

RAYTOWN POLICE DEPT
10000 E 59TH ST
RAYTOWN, MO 64133

RE: Motorola Quote for Budgetary quote for APX4500 APX4000 Batteries
Dear Director Krista Rhodes,

Motorola Solutions, Inc. is pleased to present RAYTOWN POLICE DEPT with this quote for quality communications equipment and services. The development of this quote provided us the opportunity to evaluate your requirements and propose a solution to best fulfill your communications needs.

For over 60 years Commenco has partnered with Motorola to ensure that our customers are provided exceptional products for all of their communication needs. Commenco understands your time, effort and funds are important to you as well as your citizens. We strive to ensure your needs are being met by providing necessary information so you can make an informed decision. Most importantly, we listen to your needs and give you the products that will fit both your department's mission and finances. Thank you for allowing us to provide your communications needs now and in the future.

This information is provided to assist you in your evaluation process. Our goal is to provide RAYTOWN POLICE DEPT with the best products and services available in the communications industry. Please direct any questions to James Brafford at james.brafford@commenco.com.

We thank you for the opportunity to provide you with premier communications and look forward to your review and feedback regarding this quote.

Sincerely,

James Brafford
Public Safety Account Manager

Motorola Solutions Manufacturer's Representative

Billing Address:
RAYTOWN POLICE DEPT
10000 E 59TH ST
RAYTOWN, MO 64133
US

Shipping Address:
RAYTOWN POLICE DEPT
10000 E 59TH ST
RAYTOWN, MO 64133
US

Quote Date:10/01/2019
Expiration Date:12/30/2019
Quote Created By:
James Brafford
Public Safety Account Manager
james.brafford@commenco.com
816-753-2166 Ext 336

Customer:
RAYTOWN POLICE DEPT
Director Krista Rhodes
rhodesk@raytownpolice.org
816-737-6178

Contract: 21810 - JOHNSON COUNTY
(KS)
Payment Terms:30 NET

Summary:

The information below includes five APX4500 Dash Mount mobile radio, one APX4500 for a go-pack, six APX4000 Portable radios and spare batteries. Programming of the current template is included, any changes necessary will require an additional quote from Commenco. No installation is included with this quote.

Line #	Item Number	Description	Qty	List Price	Sale Price	Ext. Sale Price
	APX™ 4000 Series	APX4000				
1	H51UCF9PW6AN	APX 4000 7/800 MHZ MODEL 2 PORTABLE	6	\$1,963.00	\$1,177.80	\$7,066.80
1a	QA02756AB	ENH: 3600 OR 9600 TRUNKING BAUD SINGLE SYSTEM	6	\$1,570.00	\$942.00	\$5,652.00
1b	H869CE	ENH: MULTIKEY	6	\$330.00	\$198.00	\$1,188.00
1c	Q629AM	ENH: AES ENCRYPTION	6	\$475.00	\$285.00	\$1,710.00
1d	H885BK	ADD: 3Y ESSENTIAL SERVICE	6	\$90.00	\$90.00	\$540.00
2	PMPN4174A	CHGR DESKTOP SINGLE UNIT IMPRES, US/NA	6	\$76.00	\$45.60	\$273.60
3	NNTN8128BR	BATT IMPRES LIION 2000T	10	\$117.00	\$70.20	\$702.00



Motorola's quote is based on and subject to the terms and conditions of the valid and executed written contract between Customer and Motorola (the "Underlying Agreement") that authorizes Customer to purchase equipment and/or services or license software (collectively "Products"). If no Underlying Agreement exists between Motorola and Customer, then Motorola's Standard Terms of use and Purchase Terms and Conditions govern the purchase of the Products.

Line #	Item Number	Description	Qty	List Price	Sale Price	Ext. Sale Price
4	PMMN4099BL	AUDIO ACCESSORY- REMOTE SPEAKER MICROPHONE,IP68 REMOTE SPEAKER MICROPHONE, 3.5MM,UL	6	\$132.00	\$79.20	\$475.20
5	M22URS9PW1AN	APX4500 7/800 MHZ	5	\$1,564.00	\$938.40	\$4,692.00
5a	G24AX	ENH: 3 YEAR ESSENTIAL SVC	5	\$131.00	\$131.00	\$655.00
5b	GA00235AA	ADD: NO GPS ANTENNA NEEDED APX	5	\$0.00	\$0.00	\$0.00
5c	G142AD	ADD: NO SPEAKER APX	5	\$0.00	\$0.00	\$0.00
5d	QA02756AD	ADD: 3600 OR 9600 TRUNKING BAUD SINGLE SYSTEM	5	\$1,570.00	\$942.00	\$4,710.00
5e	G843AH	ADD: AES ENCRYPTION	5	\$475.00	\$285.00	\$1,425.00
5f	W969BM	ADD: MULTIKEY	5	\$330.00	\$198.00	\$990.00
5g	GA00804AA	ADD: APX O2 CH (GREY)	5	\$492.00	\$295.20	\$1,476.00
5h	G444AH	ADD: APX CONTROL HEAD SOFTWARE	5	\$0.00	\$0.00	\$0.00
5i	W22BA	ADD: STD PALM MICROPHONE APX	5	\$72.00	\$43.20	\$216.00
5j	G174AF	ADD: ANT 3DB LOW-PROFILE 762-870	5	\$43.00	\$25.80	\$129.00
5k	G66AW	ADD: DASH MOUNT O2 CH WWM	5	\$125.00	\$75.00	\$375.00
6	M22URS9PW1AN	APX4500 7/800 MHZ	1	\$1,564.00	\$938.40	\$938.40
6a	G24AX	ENH: 3 YEAR ESSENTIAL SVC	1	\$131.00	\$131.00	\$131.00
6b	GA00235AA	ADD: NO GPS ANTENNA NEEDED APX	1	\$0.00	\$0.00	\$0.00
6c	G142AD	ADD: NO SPEAKER APX	1	\$0.00	\$0.00	\$0.00
6d	QA02756AD	ADD: 3600 OR 9600 TRUNKING BAUD SINGLE SYSTEM	1	\$1,570.00	\$942.00	\$942.00
6e	G843AH	ADD: AES ENCRYPTION	1	\$475.00	\$285.00	\$285.00



Motorola's quote is based on and subject to the terms and conditions of the valid and executed written contract between Customer and Motorola (the "Underlying Agreement") that authorizes Customer to purchase equipment and/or services or license software (collectively "Products"). If no Underlying Agreement exists between Motorola and Customer, then Motorola's Standard Terms of use and Purchase Terms and Conditions govern the purchase of the Products.

Line #	Item Number	Description	Qty	List Price	Sale Price	Ext. Sale Price
6f	W969BM	ADD: MULTIKEY	1	\$330.00	\$198.00	\$198.00
6g	GA00804AA	ADD: APX O2 CH (GREY)	1	\$492.00	\$295.20	\$295.20
6h	G89AC	ADD: NO RF ANTENNA NEEDED	1	\$0.00	\$0.00	\$0.00
6i	G444AH	ADD: APX CONTROL HEAD SOFTWARE	1	\$0.00	\$0.00	\$0.00
6j	G66AW	ADD: DASH MOUNT O2 CH WWM	1	\$125.00	\$75.00	\$75.00
6k	G90AC	ADD: NO MICROPHONE NEEDED APX	1	\$0.00	\$0.00	\$0.00

Grand Total

\$35,140.20(USD)



Purchase Order Checklist

Marked as PO/ Contract/ Notice to Proceed on Company Letterhead
(PO will not be processed without this)

PO Number/ Contract Number

PO Date

Vendor = Motorola Solutions, Inc.

Payment (Billing) Terms/ State Contract Number

Bill-To Name on PO must be equal to the *Legal* Bill-To Name

Bill-To Address

Ship-To Address (If we are shipping to a MR location, it must be documented on PO)

Ultimate Address (If the Ship-To address is the MR location then the Ultimate Destination address must be documented on PO)

PO Amount must be equal to or greater than Order Total

Non-Editable Format (Word/ Excel templates cannot be accepted)

Bill To Contact Name & Phone # and EMAIL for customer accounts payable dept

Ship To Contact Name & Phone #

Tax Exemption Status

Signatures (As required)



BE BETTER EQUIPPED TO BE MISSION READY

APX™ 4500 PROJECT 25 MOBILE RADIO

A downed power line or the city transit system coming to a halt during rush hour, when the unexpected strikes, you must interoperate seamlessly and securely with other agencies and responders – often across multiple Project 25 (P25) systems. You need to instantly connect and be informed to make better decisions and respond effectively. While the advanced technology of APX™ radios expertly equips you for the unexpected, your organization may be challenged to improve operating expenses.

That's where the APX 4500 P25 mobile radio fits the bill perfectly. It delivers all the benefits of TDMA technology in a compact P25 capable mobile. The APX 4500 brings together powerful technology in an easy-to-use radio that's easy on your budget. It seamlessly unifies public works, utility, rural public safety and transportation users to first responders so they can communicate effectively in the moments that matter.

CONVENIENTLY SMALL, EASY TO INSTALL

The APX 4500 is designed to get the job done without getting in the way. A simplified dash mount design makes installation quick and easy, fitting into the existing XTL™ footprint so you can reuse mounting holes and cables.

Count on the APX 4500 to withstand wet, dusty and hazardous conditions, too. Its IP56 durability rating is the highest level of certification for uncompromising durability and world class quality in a mobile performer you can hose down.

KEEPS CREWS IN TOUCH, AND UP TO THE MINUTE

Safety runs in the APX family and the APX 4500 mobile is no exception. Like all our APX P25 radios trusted by responders worldwide, the APX 4500 mobile redefines safety. Your crews can count on quick, seamless interoperability and extended range – whether they are talking from the top of a pole or the bottom of a trench. You can depend on AES encryption for secure, tamperproof voice and data communications every time they connect.

With integrated GPS in the APX 4500, you can keep an eye on workers and assets you can't see, tracking their locations continuously. The O2 control head with color display is easy to read and operate in all lighting conditions, from bright sunlight to dark streets. The intelligent lighting on the O2 control head notifies your workers when a call is received, an emergency arises, or when they are out of range. Plus, an enlarged multifunction knob makes it easy to use talk-group and volume settings when they're wearing gloves.

Over-the-air programming on the APX 4500 keeps your crews current in the field. You can update the latest mobile without interrupting voice communications while they work.

SIZED RIGHT FOR YOUR BUDGET

The APX 4500 lets you reuse many accessories which utilize the O5 and O3 control heads on XTL radios, so you can maximize your investment while you benefit from the latest technology. Since the APX 4500 is P25 Phase 2 capable for twice the voice capacity, you can add more users without adding more frequencies or infrastructure. It is backwards and forwards compatible with all Motorola mission critical radio systems, so you can interoperate with confidence while you improve operating expenses.



MISSION READY WHEN IT MATTERS MOST

APX™ 4000 PROJECT 25 PORTABLE RADIO

Chemical spill. Catastrophic storm. Power outage. When every minute matters, you must communicate instantly with other agencies and responders. But how do you prepare for a disaster and keep control of operating costs? That's where the APX™ 4000 P25 portable radio answers the call, expertly and affordably.

The APX 4000 delivers all the benefits of TDMA technology in the smallest P25 capable portable in the industry. Easy to use, tough as nails, a hard value to beat, it seamlessly connects public safety agencies and public works for fast, interoperable communications.

EVERY INCH AN APX

The APX 4000 leverages the leading attributes of the APX family of P25 TDMA portables. From the 2-microphone design that reduces background noise so you can speak and hear clearly over heavy equipment, diesel engines and sirens to the high-spec RF performance for excellent coverage in challenging environments.

With its easy-to-use interface, color display, intelligent lighting and radio profiles, you get all the power of APX in a compact radio. Plus, you can extend the performance of your radio with a complete portfolio of industry-leading IMPRES smart energy and audio accessories.

COMPACT AND UNCOMPROMISING

The smallest P25 Phase 2 capable portable, the APX 4000 gets the job done without getting in the way. Simplified controls and a choice of either dedicated volume and channel knobs, or an enlarged multifunction knob, the APX 4000 provides readiness for any type of work setting. And its standard IP67 and MIL-STD certified to withstand dust, heat, shock, drops and water immersion, so you can count on it wherever you need it – at the factory line, power line or fire line.

P25 PERFORMANCE, INSIDE AND OUT

Loaded with key P25 features to increase safety, the APX 4000 features Mission Critical Wireless, a unique Bluetooth® solution that provides an encrypted link to a high performance earpiece, GPS for quickly locating personnel outdoors, AES encryption for improved security, and over-the-air programming to program radios in the field without interrupting voice operation.

IMPROVE RESPONSE AND EXPENSES

The APX 4000 is P25 Phase 2 capable for twice the voice capacity so you can add more users without adding more frequencies or infrastructure. And it's backwards and forwards compatible with all Motorola mission critical radio systems, so you can interoperate with confidence while you improve operating expenses.

POWER UP WITH APX 4000 ACCESSORIES

- Designed, tested and certified for optimum performance with your radio
- Complete portfolio of remote speaker microphones, headsets and Mission Critical Wireless Bluetooth® accessories
- High-powered IMPRES™ batteries that have a slim design to fit the compact radio size

PRODUCT SPEC SHEET
APX™ 4000



FEATURES AND BENEFITS

Available in 700/800 MHz, VHF, UHF R1, UHF R2 and 900 MHz bands

Trunking standards supported:

- Clear or digital encrypted ASTRO®25 Trunked Operation
- Capable of SmartZone®, SmartZone Omnilink, SmartNet®

Analog MDC-1200 and Digital APCO P25 Conventional System Configurations

Narrow and wide bandwidth digital receiver (6.25 kHz equivalent / 12.5 kHz / 30 kHz / 25 kHz)¹

Standard with 2 dedicated control knobs for volume and channel changes

Embedded digital signaling (ASTRO & ASTRO 25)

Man Down

Available in 2 models

Integrated GPS capable

Lightbar with Intelligent Lighting

Radio Profiles

Unified Call List

User programmable Voice Announcement

Meets Applicable MIL-STD-810C, D, E, F and G

IP67 standard (submersible 1 meter, 30 minutes)²

Superior Audio Features:

- 0.5 W high audio speaker
- 2-mic noise canceling technology

Utilizes Windows XP, Vista and Windows 7 Customer Programming Software (CPS)

- Supports USB communications
- Built in FLASHport™ support

Full portfolio of accessories including IMPRES batteries, chargers and audio devices³

OPTIONAL FEATURES

- Mission Critical Wireless⁴
- AES Encryption
- Programming Over Project 25
- Text Messaging
- GPS Location Tracking
- Man Down
- Site Selectable Alert Tones
- P25 Over the Air re-keying
- P25 Link Layer Authentication
- Enhanced Data
- Multifunction Knob
- Rugged Submersible housing (2 meters for 2 hours)⁷

¹ Per the FCC Narrowbanding rules, new products (APX4000 VHF, UHF R1, UHF R2) submitted for FCC certification after January 1, 2011 are restricted from being granted certification at 25KHz for United States - State & Local Markets only.

² Radios meet industry standards (IPX7) for immersion.

³ Chargers and batteries for the APX 4000 radios do not interoperate with other APX radios.

⁴ Compatible with BT 2.0 and HSP and PAN BT Profiles.

⁵ When used with a Hazardous Location tested radio.

⁶ Only available in multifunction knob model.

⁷ Only compatible with 2 knob model.

TRANSMITTER - TYPICAL PERFORMANCE SPECIFICATIONS

		700/800	VHF	UHF Range 1	UHF Range 2	900 MHz ⁶
Frequency Range/ Bandsplits	700 MHz	763-776, 793-806 MHz	136-174 MHz	380-470 MHz	450-520 MHz	896-901, 935-940 MHz
	800 MHz	806-824, 851-870 MHz				
Channel Spacing		25/12.5 kHz	30/25/12.5 kHz	25/12.5 kHz	25/12.5 kHz	12.5 kHz
Maximum Frequency Separation		Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit
Rated RF Output Power Adj ¹		1-3 Watts Max	1-5 Watts Max	1-5 Watts Max	1-5 Watts Max	1-2.5 Watts Max
Frequency Stability ¹ (-30°C to +60°C; +25°C Ref.)		±0.00010 %	±0.00010 %	±0.00010 %	±0.00010 %	±0.00010 %
Modulation Limiting ¹		±5 kHz / ±4 kHz / ±2.5 kHz	±5 kHz / ±4 kHz / ±2.5 kHz	±5 kHz / ±4 kHz / ±2.5 kHz	±5 kHz / ±4 kHz / ±2.5 kHz	±2.5 kHz
Emissions (Conducted and Radiated) ¹		-75 dB	-75 dB	-75 dB	-75 dB	-75 dB
Audio Response ¹		+1, -3 dB	+1, -3 dB	+1, -3 dB	+1, -3 dB	+1, -3 dB
FM Hum & Noise	25 kHz	-47 dB	-47 dB	-47 dB	-47 dB	-47 dB
	12.5 kHz	-45 dB	-47 dB	-45 dB	-45 dB	-45 dB
Audio Distortion ¹	25 kHz 12.5 kHz	1.00%	1.00%	1.00%	1.00%	1.00%

BATTERIES FOR APX 4000

Battery Capacity / Type	Dimensions (HxWxD)	Weight	Battery Part Number	Battery Capacity
Li-Ion IMPRES 1900 mAh IP67	114.5x55.04x17.85	150 grams	NNTN8128A	1900 mAh
Li-Ion IMPRES 2300 mAh IP67 Non-HazLoc	114.5x55.04x23.15	160 grams	PMNN4424AR	2300 mAh
Li-Ion IMPRES 2300 mAh IP67 HazLoc ⁵	114.5x55.04x23.15	180 grams	NNTN8560A	2300 mAh

PRODUCT SPEC SHEET

APX™ 4000



MODEL 2



MODEL 3

RADIO MODELS		
	MODEL 2	MODEL 3
Display	Full bitmap color LCD display 3 lines of text x 14 characters 1 line of icons 1 menu line x 3 menus White backlight	Full bitmap color LCD display 3 lines of text x 14 characters 1 line of icons 1 menu line x 3 menus White backlight
Keypad	Backlight keypad 3 soft keys 4 direction Navigation key Home and Data buttons	Backlight keypad 3 soft keys 4 direction navigation key 4x3 keypad Home and Data buttons
Channel Capacity	512	512
FLASHport Memory	64 MB	64 MB
700/800 MHz (763-870 MHz)	H51UCF9PW6AN Q360GK	H51UCH9PW7AN Q360GK
VHF (136-174 MHz)	H51KDF9PW6AN Q360GX	H51KDH9PW7AN Q360GX
UHF Range 1 (380-470 MHz)	H51QDF9PW6AN Q360GL	H51QDH9PW7AN Q360GL
UHF Range 2 (450-520 MHz)	H51SDF9PW6AN Q360HA	H51SDH9PW7AN Q360HA
900 MHz (896-940 MHz)	H51WCF9PW6AN Q360JF	H51WCH9PW7AN Q360JE
Buttons & Switches	Large PTT button ■ Angled On/Off Volume Control ■ 16 position top-mounted rotary switch ■ Orange emergency button ■ 3 programmable side buttons	

TRANSMITTER CERTIFICATION

700/800 (764-869 MHz)	AZ489FT7049
VHF (136-174 MHz)	AZ489FT3828
UHF Range 1 (380-470 MHz)	AZ489FT4905
UHF Range 2 (450-520 MHz)	AZ489FT4910
900 MHz (896-901, 935-940 MHz)	AZ489FT5864

FCC EMISSIONS DESIGNATORS

FCC Emissions Designators	11K0F3E, 16K0F3E, 8K10F1D, 8K10F1E, 8K10F1W, 20K0F1E*
FCC Emissions Designators for 900 MHz	11K0F3E, 8K10F1D, 8K10F1E, 8K10F1W

POWER SUPPLY

Power Supply	One rechargeable Li-Ion 1900 mAh battery standard, or 2300 mAh/2700 mAh high cap Li-Ion.
--------------	--

* Per the FCC Narrowbanding rules, new products (APX4000 VHF, UHF1, UHF2) submitted for FCC certification after January 1, 2011 are restricted from being granted certification at 25KHz for United States - State & Local Markets only.

RECEIVER - TYPICAL PERFORMANCE SPECIFICATIONS

		700/800	VHF	UHF Range 1	UHF Range 2	900 MHz
Frequency Range/Bandsplits	700 MHz 800 MHz	763-776 MHz 851-870 MHz	136-174 MHz	380-470 MHz	450-520 MHz	935-940 MHz
Channel Spacing		25/12.5 kHz	30/25/12.5 kHz	25/12.5 kHz	25/12.5 kHz	12.5 kHz
Maximum Frequency Separation		Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit
Audio Output Power at Rated ¹		500mW	500mW	500mW	500mW	500mW
Frequency Stability ¹ (-30°C to +60°C; +25°C Ref.)		±0.00010 %	±0.00010 %	±0.00010 %	±0.00010 %	±0.00010 %
Analog Sensitivity ²	12 dB SINAD	0.266µV	0.216µV	0.234µV	0.234µV	0.236µV
Digital Sensitivity ⁴	1% BER (800 MHz)	0.400µV	0.277µV	0.307µV	0.307µV	0.33µV
	5% BER	0.266µV	0.188µV	0.207µV	0.207µV	0.222µV
Selectivity ¹	25 kHz channel	-76 dB	-76 dB	-76 dB	-76 dB	-67 dB
	12.5 kHz channel	-67 dB	-70 dB	-67 dB	-67 dB	-67 dB
Intermodulation		-75 dB	-76 dB	-77 dB	-77 dB	-75 dB
Spurious Rejection		-76.6 dB	-85 dB	-80.3 dB	-90 dB	-80 dB
FM Hum and Noise	25 kHz	-53 dB	-51 dB	-50 dB	-50 dB	-47 dB
	12.5 kHz	-47 dB	-45 dB	-45 dB	-45 dB	-47 dB
Audio Distortion ¹		1.00%	1.00%	1.00%	1.00%	1.00%

PRODUCT SPEC SHEET
APX™ 4000

PORTABLE MILITARY STANDARDS 810 C, D, E, F & G										
	MIL-STD 810C		MIL-STD 810D		MIL-STD 810E		MIL-STD 810F		MIL-STD 810G	
	Method	Proc./Cat.	Method	Proc./Cat.	Method	Proc./Cat.	Method	Proc./Cat.	Method	Proc./Cat.
Low Pressure	500.1	I	500.2	II	500.3	II	500.4	II	500.5	II
High Temperature	501.1	I, II	501.2	I/A1, II/A1	501.3	I/A1, II/A1	501.4	I/Hot, II/Basic Hot	501.5	I/A1, II/A2
Low Temperature	502.1	I	502.2	I/C3, II/C1	502.3	I/C3, II/C1	502.4	I/C3, II/C1	502.5	I/C3, II/C1
Temperature Shock	503.1	I	503.2	I/A1C3	503.3	I/A1C3	503.4	I	503.5	I/C
Solar Radiation	505.1	II	505.2	I	505.3	I	505.4	I	505.5	I/A1
Rain	506.1	I, II	506.2	I, II	506.3	I, II	506.4	I, III	506.5	I, III
Humidity	507.1	II	507.2	II	507.3	II	507.4	1 Proc	507.5	II/Aggravated
Salt Fog	509.1	I	509.2	I	509.3	I	509.4	1 Proc	509.5	1 Proc
Blowing Dust	510.1	I	510.2	I	510.3	I	510.4	I	510.5	I
Blowing Sand	1 Proc	1 Proc	510.2	II	510.3	II	510.4	II	510.5	II
Vibration	514.2	VIII/F, Curve-W	514.3	I/10, II/3	514.4	I/10, II/3	514.5	I/24	514.6	I/24
Shock	516.2	I, III, V	516.3	I, V, VI	516.4	I, V, VI	516.5	I, V, VI	516.6	I, V, VI
Shock (Drop)	516.2	II	516.2	IV	516.4	IV	516.5	IV	516.6	IV

DIMENSIONS OF THE RADIOS WITHOUT BATTERY				GPS SPECIFICATIONS	
	Inches (1 knob/2 knob)	Millimeters (1 knob/2 knob)			
Length	5.26/5.42	133/137.7	Channels		12
Width Push-To-Talk button	2.37/2.42	60.2/61.4	Tracking Sensitivity		-159 dBm
Depth Push-To-Talk button	1.72/1.41	43.6/35.75	Accuracy ⁵		<10 meters (95%)
Width Top	2.56/2.62	65/66.55	Cold Start		<60 seconds (95%)
Depth Top	2.13/1.84	43/46.7	Hot Start		<10 seconds (95%)
Weight of the radios without battery	9.17 oz/10.05 oz	260 g/285 g	Mode of Operation		Autonomous (Non-Assisted) GPS

ENCRYPTION		ENVIRONMENTAL SPECIFICATIONS	
Supported Encryption Algorithms	ADP, AES, DES, DES-XL, DES-OFB, DVP-XL	Operating Temperature ⁶	-30°C / +60°C
Encryption Algorithm Capacity	8	Storage Temperature ⁶	-40°C / +85°C
Encryption Keys per Radio	Module capable of storing 1024 keys. Programmable for 64 Common Key Reference (CKR) or 16 Physical Identifier (PID)	Humidity	Per MIL-STD
Encryption Frame Re-sync Interval	P25 CAI 300 mSec	ESD	IEC 801-2 KV
Encryption Keying	Key Loader	Water and Dust Intrusion	IP67
Synchronization	XL – Counter Addressing OFB – Output Feedback	Immersion	MIL-STD 512.X/I
Vector Generator	National Institute of Standards and Technology (NIST) approved random number generator		
Encryption Type	Digital		
Key Storage	Tamper protected volatile or non-volatile memory		
Key Erasure	Keyboard command and tamper detection		
Standards	FIPS 140-2 Level 3; FIPS 197		

¹ Measured in the analog mode per TIA / EIA 603 under nominal conditions
² When used with an FM approved intrinsically safe radio
³ Measured conductively in analog mode per TIA / EIA 603 under nominal conditions.
⁴ Measured conductively in digital mode per TIA / EIA IS 102.CAAA under nominal conditions.
⁵ Accuracy specs are for long-term tracking (95th percentile values >5 satellites visible at a nominal -130 dBm signal strength).
⁶ Temperatures listed are for radio specifications. Battery storage is recommended at 25°C, ±5°C to ensure best performance.
 Specifications subject to change without notice. All specifications shown are typical. Radio meets applicable regulatory requirements.

Motorola Solutions, Inc. 1301 East Algonquin Road Schaumburg, Illinois 60196, U.S.A. 800-367-2346
motorolasolutions.com

MOTOROLA, MOTO, MOTOROLA SOLUTIONS and the Stylized M Logo are trademarks or registered trademarks of Motorola Trademark Holdings, LLC and are used under license. All other trademarks are the property of their respective owners. © 2014 Motorola Solutions, Inc. All rights reserved.

R3-4-2050D



PRODUCT SPEC SHEET
APX™ 4500 MOBILE RADIO



APX™ 4500 SPECIFICATIONS

FEATURES AND BENEFITS:

Available in 700/800 MHz, VHF, UHF1, UHF2, and 900 MHz.
Supports NPCS band (901-902 MHz and 940-941 MHz)

Channels: Standard 512

Trunking Standards supported:

- Clear or digital encrypted Trunked Operation
- Capable of SmartZone®, SmartZone Omnilink, SmartNet®

Analog MDC-1200 and Digital APCO P25
Conventional System Configurations

Narrow and wide bandwidth digital receiver
(6.25kHz/12.5kHz/25kHz/30 kHz)

Embedded digital signaling (ASTRO and ASTRO 25)

Integrated GPS capable

Integrated Encryption Hardware

Intelligent lighting

Radio profiles

Unified Call List

Meets applicable MIL-STD 810C, D, E, F, G

Ships standard IP56

Utilizes Windows XP, Vista and Windows 7
Customer Programming Software (CPS)

- Supports USB Communications
- Built in FLASHport™ support

Re-use of most XTL™ accessories, plus new
IMPRES accessories

OPTIONAL FEATURES:

AES Encryption

Programming over Project 25 (POP25)

Text Messaging

12 character RF ID asset tracking

Tactical OTAR

APX 4500 CONTROL HEAD PORTFOLIO



02 RUGGED CONTROL HEAD

- Large color display with intelligent lighting
- 3 lines of text 14 characters max / 1 line of icons / 1 line of menus
- Built in 7.5 watt speaker
- Multifunction volume/channel knob
- Night/day mode button

PRODUCT SPEC SHEET
APX™ 4500 MOBILE RADIO

TRANSMITTER - TYPICAL PERFORMANCE SPECIFICATIONS

	700 MHz	800 MHz	VHF	UHF Range 1	UHF Range 2	900 MHz		
Frequency Range/Bandsplits	764-776 MHz 794-806 MHz	806-824 MHz 851-870 MHz	136-174 MHz	380-470 MHz	450-520 MHz	896-902MHz 935-941MHz		
Channel Spacing	25/12.5 kHz	25/12.5 kHz	30/25/12.5 kHz	25/12.5 kHz	25/12.5 kHz	12.5 kHz		
Maximum Frequency Separation	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit		
Rated RF Output Power Adj*	2-30 Watts (2-3 Watts Itinerant)	2-35 Watts	1-50 Watts	1-40 Watts	1-45 Watts (450-485 MHz) 1-40 Watts (485-512 MHz) 1-25 Watts (512-520 MHz)	1-30W 896-901MHz 935-940MHz 1-3W 901-902MHz 940-941MHz		
Frequency Stability* (-30°C to +60°C; +25°C Ref.)	0.8 PPM	±0.8 PPM	±0.8 PPM	±0.8 PPM	±0.8 PPM	±0.8 PPM		
Modulation Limiting*	±5 kHz / ±2.5 kHz	±5 kHz/±4 kHz (NPSPAC) /±2.5 kHz	±5 kHz / ±2.5 kHz	±5 kHz / ±2.5 kHz	±5 kHz / ±2.5 kHz	±2.5 kHz		
Modulation Fidelity (C4FM) 12.5kHz Digital Channel	1.5%	1.5%	2.5%	1.1%	1.1%	1.5%		
Emissions*	Conducted+ -75/-85 dBc	Radiated+ -20/-40 dBm	Conducted -75 dBc	Radiated -20 dBm	Conducted -85 dBc	Radiated -20 dBm	Conducted+ -70 dBc	Radiated+ -20 dBm
Audio Response*	+1, -3 dB (EIA)	+1, -3 dB (EIA)	+1, -3 dB (EIA)	+1, -3 dB (EIA)	+1, -3 dB (EIA)	+1, -3 dB (EIA)	+1, -3 dB (EIA)	
FM Hum & Noise	25 & 20 kHz 12.5 kHz	-50 dB -48 dB	-50 dB -48 dB	-52 dB -51 dB	-51 dB -48 dB	-51 dB -48 dB	- -45 dB	
Audio Distortion*	25 & 20 kHz 12.5 kHz	0.50% 0.50%	0.50% 0.50%	0.50% 0.50%	0.50% 0.50%	0.50% 0.50%	- 0.80 %	

RECEIVER – TYPICAL PERFORMANCE SPECIFICATIONS

	700 MHz	800 MHz	VHF	UHF Range 1	UHF Range 2	900 MHz				
Frequency Range/Bandsplits	764-776 MHz	851-870 MHz	136-174 MHz	380-470 MHz	450-520 MHz	935-941MHz				
Channel Spacing	25/12.5 kHz	25/12.5 kHz	30/25/12.5 kHz	25/12.5 kHz	25/12.5 kHz	12.5 kHz				
Maximum Frequency Separation	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit	Full Bandsplit				
Audio Output Power at 3% distortion*	7.5 W or 15 W ++	7.5 W or 15 W ++	7.5 W or 15 W ++	7.5 W or 15 W ++	7.5 W or 15 W ++	7.5 W or 15 W ++				
Frequency Stability* (-30°C to +60°C; +25°C Ref.)	±0.00008%	±0.00008%	±0.00008%	±0.00008%	±0.00008%	±0.8 PPM				
Analog Sensitivity*	12 dB SINAD	-120 dBm	-120 dBm	Pre-Amp -123 dBm	Standard -119 dBm	Pre-Amp -123 dBm	Standard -119 dBm	Standard -120dBm		
Digital Sensitivity	5% BER	-121 dBm	-121 dBm	-123 dBm	-119 dBm	-123 dBm	-119 dBm	-121dBm		
Intermodulation	25 kHz 12.5 kHz	82 dB 82 dB	82 dB 82 dB	82 dB 83 dB	87 dB 86 dB	81 dB 82 dB	86 dB 85 dB	81 dB 82 dB	86 dB 85 dB	- 82 dB
Spurious Rejection		91 dB	91 dB	95 dB		91 dB		91 dB		91 dB
Audio Distortion at rated*		1.20%	1.20%	1.20%		1.20%		1.20%		2 %
Selectivity*	25 kHz 12.5 kHz 30 kHz	85 dB 75 dB —	85 dB 75 dB —	85 dB 75 dB 90 dB		85 dB 75 dB —		85 dB 75 dB —		— 74dB —

DIMENSIONS

	Inches	Millimeters
Mid Power Radio Transceiver	2 x 7 x 6.4	50.8 x 178 x 163
O2 Control Head	2.7 x 8.1 x 2.1	69 x 207 x 53
Mid Power Radio Transceiver and O2 Control Head - Dash Mount	2.7 x 8.1 x 8.8	69 x 207 x 223
Mid Power Radio Transceiver and O2 Control Head Weight	5.28 lbs	2.45 kg

RADIO MODELS

700/800 (764-870 MHz)	M22URSS9PW1AN
VHF (136-174 MHz)	M22KSS9PW1AN
UHF Range 1 (380-470 MHz)	M22QSS9PW1AN
UHF Range 2 (450-520 MHz)	M22SSS9PW1AN
900 MHz (896-941 MHz)	M22WRS9PW1AN

SIGNALING (ASTRO MODE)

Signaling Rate	9.6 kbps
Digital ID Capacity	10,000,000 Conventional / 48,000 Trunking
Digital Network Access Codes	4,096 network site addresses
ASTRO® Digital User Group Addresses	4,096 network site addresses
Project 25 – CAI Digital User Group Addresses	65,000 Conventional / 4,094 Trunking
Error Correction Techniques	Golay, BCH, Reed-Solomon codes
Data Access Control	Slotted CSMA: Utilizes infrastructure-sourced data status bits embedded in both voice and data transmissions.

GPS SPECIFICATIONS

Channels	12
Tracking Sensitivity	-153 dBm
Accuracy**	<10 meters (95%)
Cold Start	<60 seconds (95%)
Hot Start	<10 seconds (95%)
Mode of Operation	Autonomous (Non-Assisted) GPS

PRODUCT SPEC SHEET
APX™ 4500 MOBILE RADIO

POWER AND BATTERY DRAIN

Model Type	136-174 MHz, 380-470 MHz, 450-520 MHz, 764-870 MHz, 896-941MHz				
Minimum RF Power Output	2-30 Watts (764-776 MHz), 2-30 Watts (794-806 MHz), 2-35 Watts (806-824 MHz), 2-35 Watts (851-870 MHz), 1-50 Watts (136-174 MHz), 1-40 Watts (380-470 MHz), 1-45 Watts (450-485 MHz), 1-40 Watts (485-512 MHz), 1-25 Watts (512-520 MHz), 1-30Watts (896-901MHz), 1-3Watts (901-902MHz), 1-30W (935-940MHz), 1-3Watts (940-941MHz)				
Operation	13.8V DC ±20% Negative Ground				
Standby at 13.8V	0.85A (764-870 MHz), 0.85A (136-174 MHz), 0.85A (380-470 MHz), 0.85A (450-520 MHz), 0.85A (896-941MHz)				
Receive Current at Rated Audio at 13.8V	3.2A (764-870 MHz), 3.2A (136-174 MHz), 3.2A (380-470 MHz), 3.2A (450-520 MHz), 3.2A (935-941MHz)				
Transmit Current (A) at Rated Power	136-174 MHz (1-50 Watts)	13A (50W)	8A (15W)	764-870 MHz (2***-35W)	12A (35W) 8A (15W)
	380-470 MHz (1-40 Watts)	11A (40W)	8A (15W)	896-901MHz (1-30W)	10A (30W) 7A(15W)
	450-520 MHz (1-45 Watts)	11A (45W)	8A (15W)	935-940MHz(1-30W)	10A (30W) 7A(15W)
				901-902MHz(1-3W)	5A (3W)
				940-941MHz(1-3W)	5A (3W)

MOBILE MILITARY STANDARDS 810 C, D, E, F, G

	MIL-STD 810C		MIL-STD 810D		MIL-STD 810E		MIL-STD 810F		MIL-STD 810G	
	Method	Proc./Cat.	Method	Proc./Cat.	Method	Proc./Cat.	Method	Proc./Cat.	Method	Proc./Cat.
Low Pressure	500.1	I	500.2	II	500.3	II	500.4	II	500.5	II
High Temperature Storage	501.1	I	501.2	I/A1	501.3	I/A1	501.4	I/Hot	501.5	I/A1
High Temperature Operation	501.1	II	501.2	II/A1	501.3	II/A1	501.4	II/Hot	501.5	II
Low Temperature Storage	502.1	I	502.2	I/C3	502.3	I/C3	502.4	I/C3	502.5	I/C3
Low Temperature Operation	502.1	I	502.2	II/C1	502.3	II/C1	502.4	II/C1	502.5	II
Temperature Shock	503.1	-	503.2	I/A1-C3	503.3	I/A1-C3	503.4	I/Hot-C3	503.5	I/C
Solar Radiation	505.1	II	505.2	I	505.3	I	505.4	I	505.5	I/A1
Rain Blowing	506.1	I	506.2	I	506.3	I	506.4	I	506.5	I
Rain Steady	506.1	II	506.2	II	506.3	II	506.4	III	506.5	III
Humidity	507.1	II	507.2	II	507.3	II	507.4	-	507.5	II-Aggravated
Salt Fog	509.1	-	509.2	-	509.3	-	509.4	-	509.5	1 Proc
Blowing Dust	510.1	I	510.2	I	510.3	I	510.4	I	510.5	I
Blowing Sand		-	510.2	II	510.3	II	510.4	II	510.5	II
Vibration Min. Integrity	514.2	VIII/F, Curve-W	514.3	I/10	514.4	I/10	514.5	I/24	514.6	I-Cat.24
Vibration Loose Cargo	514.2	XI	514.3	II/3	514.4	II/3	514.5	II/5	514.6	-
Shock Functional	516.2	I	516.3	I	516.4	I	516.5	I	516.6	I, V, VI

ENCRYPTION

Supported Encryption Algorithms	AES and ADP
Encryption Algorithm Capacity	Single
Encryption Keys per Radio	Module capable of storing 1024 keys. Programmable for 64 Common Key Reference (CKR) or 16 Physical Identifier (PID)
Encryption Frame Re-sync Interval	P25 CAI 300 mSec
Encryption Keying	Key Loader
Synchronization	XL – Counter Addressing, OFB – Output Feedback
Vector Generator	National Institute of Standards and Technology(NIST) approved random number generator
Encryption Type	Digital
Key Storage	Tamper protected volatile or non-volatile memory
Key Erasure	Keyboard command and tamper detection
Standards	FIPS 140-2 Level 3 FIPS 197

* Measured in the analog mode per TIA/EIA 603 under nominal conditions
 ** Accuracy specs are for long-term tracking (95th percentile values >5 satellites visible at a nominal -130 dBm signal strength)
 *** 2 W. itinerant frequencies.
 + Specs includes performance for the non-GNSS/GNSS bands
 ++ Output power in to 8 and 3.2 Ohm external speakers respectively

Specifications subject to change without notice. All specifications shown are typical. Radio meets applicable regulatory requirements.

Motorola Solutions, Inc. 1301 E. Algonquin Road, Schaumburg, Illinois 60196 U.S.A. www.motorolasolutions.com

MOTOROLA, MOTOROLA SOLUTIONS, and the stylized M Logo are trademarks or registered trademarks of Motorola Trademark Holdings, LLC and are used under license. All other trademarks are the property of their respective owners. © Motorola Solutions, Inc. 2013

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	-30°C / +60°C
Storage Temperature	-40°C / +85°C
Humidity	Per MIL-STD
ESD	IEC 801-2 KV
Water and Dust Intrusion	IP56, MIL-STD

TRANSMITTER CERTIFICATION

700/800 (764-775, 793-805, 806-824, 851-869 MHz)	AZ492FT7055
VHF (136-174 MHz)	AZ492FT4916
UHF R1 (380-470 MHz)	AZ492FT4915
UHF R2 (450-520 MHz)	AZ492FT4916
900 MHz (896-901, 901-902, 935-940, 940-941 MHz)	AZ492FT5865

FCC EMISSIONS DESIGNATORS

FCC Emissions Designators	8K10F1D, 8K10F1E, 8K10F1W, 11K0F3E, 16K0F3E, 20K0F1E, 10K0F3E (for AZ492FT5865 only)
---------------------------	--



KANSAS CITY AREA TRANSPORTATION AUTHORITY

Contract for Transit Service

RAYTOWN, MISSOURI

THIS CONTRACT, entered into this _____ day of _____, 2019, by and between the **KANSAS CITY AREA TRANSPORTATION AUTHORITY** (hereinafter referred to as the "KCATA"), a body corporate and politic and a political subdivision of both the States of Missouri and Kansas, and **RAYTOWN, MISSOURI** (hereinafter referred to as the "Community").

WITNESSETH:

WHEREAS, a sound, efficient and viable public transportation system is essential to the socioeconomic well being of the Kansas City Area Transportation District (hereinafter referred to as the "District"), including the Counties of Cass, Clay, Jackson, and Platte in Missouri, and the Counties of Johnson, Leavenworth, and Wyandotte in Kansas; and

WHEREAS, the KCATA is a public agency authorized by law to plan, own, operate, have and generally deal with public transportation systems and facilities in the District; and

WHEREAS, the Community desires to promote the convenience, comfort, prosperity, general interests and welfare of its citizens; and

WHEREAS, the public transportation facilities and services of most immediate concern are those estimated to be provided by the KCATA at a deficit, described generally in amounts and, more specifically, by formula set forth in Attachment "A" adopted in January, 1976, modified in August, 1977, revised in January, 1983, and December 1997.

NOW, THEREFORE, for and in consideration of the premises and the mutual covenants herein contained, the parties hereto agree as follows:

A. Public Mass Transit Service

1. The Community requests public transportation services (hereinafter referred to as "Contract Service"), set forth in Attachment "B", be operated by the KCATA for the period November 1, 2019, through October 31, 2020, unless sooner terminated under Paragraph "7" of this Contract.
2. The level of service as generally set forth in Attachment "B" shall not be changed or be modified without the consent of the Community.
3. The computations and, more specifically, the formula contained in Attachment "A" attached hereto and made a part hereof, are the accepted methods for the determination of the estimated deficit of the Community.
4. The KCATA and the Community estimate the Community's total payment for the service (hereinafter referred to as "Local Share") to be **\$60,237** estimate is based on

**Raytown - Twelve-Month Contract
November 1, 2019 – October 31, 2020**

the following components of cost and revenue to applied to this Agreement:

Local Service Cost	\$85,661
Passenger Revenue	<u>\$(3,801)</u>
Estimated Operating Loss	\$81,860
Less: Federal PM	(24,289)
Less: Missouri	(1,272)
Local Operating Share	\$56,299
Local Capital Share	<u>\$3,938</u>
Total Local Share	\$60,237

5. It is the understanding of the parties that, notwithstanding any provision of this Agreement, the maximum obligation of the Community under this Contract shall be the sum of **\$60,237**. If the actual total deficit and other factors are such that the KCATA deems the full Local Share is not required, the KCATA may require payment of less than the total Local Share or reimburse the Community for a portion of the Local Share previously paid.
6. The method of payment of the Local Share provided for in Paragraph "4" is as follows:
 - a. The Community's monthly Local Share will be one-twelfth (1/12) of the Community's portion of the estimated total deficit amount.
 - b. The KCATA will invoice the Community for ninety percent (90%) of Community monthly Local Share by the 15th of the month preceding the month service will be provided. The Community is required to remit ninety percent (90%) of the monthly Local Share by the first of the month service will be provided.
 - c. By the 20th of the month following the month in which service was provided, the KCATA will provide the City's Director of Development and Community Affairs, or the City Designee, with reports showing service capital and operating costs and revenue for Contract Services. The report will also provide a reconciliation of subsidy amounts with the advance payment provided to in Sub-paragraph "b". The report will detail Local Share and Federal and State Share amounts used to cover the month's service deficit. Any balance of Local Share subsidy required by the reconciliation will be invoiced at this time, to be paid within ten days.
 - d. For the month of December, the monthly report and reconciliation provided for in Sub-paragraph "c", will not be prepared until the completion of the KCATA's annual audit. The invoice of November 15, provided for in Sub-paragraph "b" will require payment of the unexpended balance of the Community's Local Share.
7. When the estimated total operating loss of **\$81,860** is reached, KCATA's obligation to furnish services shall terminate. If the actual operating loss exceeds the estimated

**Raytown - Twelve-Month Contract
November 1, 2019 – October 31, 2020**

operating loss in any two consecutive months of service, KCATA shall notify the Community. The Community and KCATA may mutually agree to amend this Contract to provide additional operating subsidy or to adjust the level of service so that the cost of such service will not exceed the contractual subsidy. If the Community and KCATA cannot agree on how to address the situation and costs do exceed the estimated loss, KCATA may terminate the service with sixty (60) day notice.

8. If for any reason the KCATA is unable to obtain the federal or state assistance, and/or the State of Missouri Public Transit Operating Assistance Grant as provided for in Paragraph "4" of this Contract, the Community will be immediately notified, and this contract will be amended to provide additional Local Share subsidy or to adjust the level of service. If a satisfactory amendment is not agreed to after a reasonable period, KCATA's obligation to furnish services will terminate.
9. The KCATA shall indemnify, save and hold the Community harmless from any and all damage, loss or liability of any kind whatsoever arising out of this Contract, including, but not limited to, any loss occasioned by reason of any injury to property or third persons occasioned, in whole or in part, by any act, omission, neglect or wrongdoing of the KCATA, or any of its officers, agents, representatives or employees. At its own cost and expense, the KCATA will defend all losses arising there from.
10. The Community recognizes that the KCATA, as the principal public transportation operator in the region, is obligated to conform to various regulations and requirements of the Federal Transit Administration in order to maintain its eligibility for financial assistance pursuant to the Federal Transit Act. In this regard, the Community agrees to cooperate with the KCATA in meeting said regulations and requirements and will not require the KCATA to violate said regulations and requirements. The Community will also cooperate with reasonable requests of the KCATA, and the KCATA agrees to make all such records available to the Community for the auditors upon reasonable request of the Community.
11. The Community, at its expense, shall have the right to cause an audit to be made of the books and records of the KCATA, and the KCATA agrees to make all such records available to the Community for the auditors upon reasonable request of the Community.
12. KCATA, at the direction of the Community, is reviewing the feasibility of alternative service options in order to improve customer service and efficiency. This includes modifications to the existing flex service, fixed-route options, and on-demand options. This analysis will be reviewed with the Community to inform future contracts.

B. Americans with Disabilities Act of 1990 Special Service Provision

**Raytown - Twelve-Month Contract
November 1, 2019 – October 31, 2020**

WHEREAS, a contractual relationship with Raytown requires that the Community not require the KCATA to provide public transit services that are in conflict with the American with Disabilities Act of 1990 and subsequent federal regulations regarding compliance with this law, it is agreed:

1. The KCATA shall perform all functions necessary for the administration, management and operation of Complementary Paratransit inside the City of Raytown.
2. The Complementary Paratransit shall be provided through the department of the KCATA known as RideKC Freedom, and these services shall be called RideKC Freedom service inside Raytown.
3. Complementary Paratransit is defined in 49 C.F.R. Part 37. In general, Complementary Paratransit is required to provide a comparable level of service whereby when all aspects of a transportation system are analyzed, equal opportunities to use the transportation system exist for all persons - individuals with and without disabilities.
4. Raytown shall reimburse the KCATA for the net cost to the KCATA, which is paid by the KCATA to its contractors that provide the transportation services inside Raytown. Raytown shall not be charged for the KCATA's administrative or dispatching expenses related to the service.
5. There will be a \$5.00 fare per trip charged to participants using RideKC Freedom service inside Raytown.
6. The KCATA shall render invoices to the City which shall include information on the number of Raytown RideKC Freedom participants, the number of trips provided of each type (ambulatory or non-ambulatory), the average cost for each type of trip, the average trip length of each type of trip, the total cost, and the net cost.
7. In no way does this contract obligate the KCATA to ensure that any other services provided by Raytown, are in compliance with the Americans with Disabilities Act (ADA) of 1990 or subsequent regulations.

**Raytown - Twelve-Month Contract
November 1, 2019 – October 31, 2020**

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed as of the day and year first above written.

KANSAS CITY AREA TRANSPORTATION AUTHORITY

By: 
Daniel Serda, Chairman of the Board of Commissioners

ATTEST:

By: 
Witness

COMMUNITY OF RAYTOWN, MISSOURI

By: _____
Name & Title: _____

ATTEST:

By: _____
Witness

ATTACHMENT "A"

REVENUE AND COST ALLOCATION PROCEDURES

The procedure to be used in determining passengers, direct operating expenses, indirect operating expenses, farebox revenue, and estimated loss for transit service shall be as follows:

- A. Passengers and Revenue** - The number of passengers and the amount of revenue reported will be derived from electronic farebox reports.
1. Revenue figures are computed as follows:
 - a. Total Fare Revenue is the total farebox revenue plus pass sales proration.
 - b. Pass Sales proration for a line is the Pass Sales Revenue multiplied by a pass utilization factor as determined by data from electronic fareboxes.
 2. Passenger types - definitions
 - a. Intra-city passenger - a passenger boarding and alighting in the same jurisdiction.
 - b. Inter-city passenger - a passenger who boards in one jurisdiction and alights in another.
 3. Computation of inter-city and intra-city passengers
 - a. Intra-city passengers for each subsidizing jurisdiction will be determined by multiplying total passengers by the appropriate intra-city passengers ratios as determined by periodic activity checks. An intra-city passenger ratio is the ratio of passengers who both board and alight a bus within that community to total route passengers on the line.
 - b. Inter-city passengers for the route will be determined by subtracting the intra-city passengers from the total route passengers.
- B. Direct Operating Expenses** - Each route shall be charged direct labor and benefits on the basis of scheduled pay hours (including allowances, spread, guarantee, and overtime) times the fully burdened operator cost per hour of service for each type of bus used (Large, Small, or Metroflex). Each route shall be charged fuel and tire expense for the same type of bus used (Large, Small or Metroflex) in the proportion of route miles per type of bus to total system miles for the same type of bus.
- C. Indirect Operating Expenses** - Indirect operating expenses shall be allocated to each route

**Raytown - Twelve-Month Contract
November 1, 2019 – October 31, 2020**

on the ratio of route miles to total system miles for the same type of bus used (Large, Small, or Metroflex). Indirect operating expenses include all expenses except direct labor and fuel and tire expense, such as maintenance cost, vanpool operations, administrative and overhead expense, and a contribution to self-insured reserves for revenue vehicle and workers compensation.

D. Estimated Net Income or Loss - Intra-City Routes - Estimated net income or loss for each route shall be calculated by subtracting total fare revenue for each route from the total operating expenses for each route.

E. Allocation of Net Income or Loss on Inter-City Routes.

1. Suburban Express Routes

- a. A suburban express route is a route or portion of a route that is designed to serve inter-city passengers and suburban community intra-city passengers, and does not serve Kansas City, Missouri, intra-city passengers.
- b. Net income or net losses of inter-city routes shall be prorated among the subsidizing jurisdictions by calculating the net loss per passenger (total operating expense less total fare revenue) and then multiplying the net loss per passenger by the number of passengers boarding in each jurisdiction.

2. Local Service Inter-City Routes

- a. A local service inter-city route is a route designed to serve Kansas City, Missouri, intra-city passengers, as well as inter-city passengers and suburban community intra-city passengers.
- b. Revenue shall be credited among subsidizing jurisdictions by assigning intra-city passenger revenue to the jurisdiction in which the trips are made. Inter-city passenger revenue shall be assigned by calculating the revenue per inter-city passenger and then by multiplying the revenue per inter-city passenger by the number of inter-city passengers boarding in each jurisdiction.
- c. Operating costs shall be allocated among subsidizing jurisdictions as follows:
 - (1) Direct labor costs shall be allocated on the basis of operator cost per hour of service multiplied by the actual time operated in each jurisdiction.
 - (2) Fuel and tire expense in the proportion of miles in each jurisdiction to total system miles.
 - (3) Indirect operating expense in the proportion of miles in each jurisdiction to total system miles.

**Raytown - Twelve-Month Contract
November 1, 2019 – October 31, 2020**

- d. The Net Income or Loss for each jurisdiction is calculated as the sum of direct labor cost, fuel and tire expense, and indirect operating expense, less passenger revenue credit.

- F. Capital Expense** - Each jurisdiction will be charged capital expense, prorated on community miles to system miles, to be used for the acquisition of buses, facilities and other equipment. The capital charge may be used for the purchase of vans for a vanpool operation that will facilitate in providing a regional transit system. Such vanpool operation must provide service to or from the Community that is reasonable when compared to the amount of the Community's capital contribution for the vans.

- G. Enclave Communities** - Local service inter-city routes operating from a part of Kansas City, Missouri, through another jurisdiction and into another portion of Kansas City, Missouri, will be treated differently for the allocation of Net Income or Loss. The Net Income or Loss for the intermediate (enclave) jurisdiction will be based on 50% of the calculated cost for that jurisdiction per Item "E". The remaining 50% of the calculated cost within the intermediate jurisdiction will be allocated to Kansas City, Missouri.

- H. For Service Implemented After December 31, 1997** – Service implemented after December 31, 1997, that is above the service level that exists as of December 31, 1997, will be allocated costs as stated in other sections of this Attachment, except for Indirect Operating Expenses. Indirect Operating Expenses shall be allocated to such service based on 45 percent of the ratio of route miles to total system miles for each type of bus. Indirect Operating Expenses include all expenses except direct labor and fuel and tire expense; such as maintenance cost, vanpool operations, administrative and overhead expense, etc.

ATTACHMENT "B"

CITY OF RAYTOWN

CONTRACT SERVICE

One route will provide service within the Raytown city limits. Service, including peak and mid-day is as follows:

Route #399--Raytown Flex provides demand-response service throughout all of Raytown and parts of Kansas City, Missouri, Monday through Friday, 6:00 a.m. to 10:00 a.m. and 2:30 p.m. to 6:30 p.m. Service will be provided with 1 bus. Reservations may be requested by calling the KCATA “Metroflex” office at (816) 346-0802.

- **Full Fare:** \$1.50 one-way fare/\$50 monthly pass
- **Reduced Fare:** \$0.75 reduced one-way fare/\$25 reduced monthly pass
 - Reduced fares are available for Medicare Cardholders, youths 12 to 18 years of age, seniors 65 years old and over, and persons with disabilities. One must present a Metro Reduced Farecard or Medicare Card to purchase a reduced fare or a reduced fare monthly pass. Applications for the Metro Reduced Farecard are available through calling (816) 221-0660.

ATTACHMENT "C"

PERFORMANCE MONITORING

1. The KCATA agrees to provide timely information on all transit related matters affecting the City to the City’s designated transit liaison.
2. The KCATA and the City will work together to seek additional funding opportunities to support transit service in Raytown.