



# AGENDA REPORT

Police Department

<b>DATE:</b>	February 7, 2023
<b>TO:</b>	Mayor Martinez and Members of the City Council
<b>FROM:</b>	Bisa French, Chief of Police
<b>Subject:</b>	Purchase of Encrypted Police Radios for Richmond Police Department
<b>FINANCIAL IMPACT:</b>	The one-time purchase of encrypted police radios will not exceed \$2,064,146.06 and will be made available by transferring cost savings due to vacancies from Richmond Police Department's salaries and wages. (Account Strings: 01197121-400002, 01191021-400003, 01191021-400004, 01194021-4000040 to account string 01191021-400701).
<b>PREVIOUS COUNCIL ACTION:</b>	N/A
<b>STATEMENT OF THE ISSUE:</b>	Richmond Police Department needs to comply with the California Department of Justice (CA DOJ) directive, mandating that all public law enforcement agencies encrypt their radio telecommunications by June 2023.
<b>RECOMMENDED ACTION:</b>	APPROVE the purchase of 175 portable police radios and 150 mobile police radios from Motorola Solutions, to comply with the California Department of Justice directive, for an amount not to exceed \$2,064,146.06 – Police Department (Chief Bisa French 510-621-1802).

**DISCUSSION:**

There is a constant increase in the number of websites, mobile apps, and a range of messaging apps that solely exist to keep the user anonymous. At the same time, sensitive information is communicated over police radios that gets broadcasted, recorded, or transcribed over various platforms in real-time. The California Department of Justice (CA DOJ) issued a directive in October 2020 mandating all public law enforcement agencies encrypt their radio telecommunications by December 31, 2022. That deadline was later extended to June 2023. The CA DOJ directive was issued to keep private information secure and eliminate individual's private information being broadcasted to the general public.

Originally, the encryption was to be added to the current radio equipment and was included and approved in the fiscal year (FY) 2021-2022 budget; however, during research to install the encryption, Motorola announced that our current communications equipment would no longer be supported at the end of the year (also known as technology's "end of life"). This would eliminate the ability to make any software changes to the unit resulting in the need to purchase new radios. With the deadline quickly approaching, and Motorola's two-to-six-month lead time, the urgency to purchase is dire. The purchase would be to replace 150 mobile auto units as well as 175 portable units worn by the officers.

Although we are transferring funds from our vacant wage and salary account strings, it will be a one-time cost, and the equipment is expected to last 10 or more years. Our current communication equipment is more than 10 years old.

The initial selection of Motorola Solutions Inc. to be sole provider of radio equipment was made by the East Bay Regional Communications Systems Authority (EBRCSA), of which, the City of Richmond is a member, to ensure continued interoperability across participating agencies. The price of each radio includes programming to our specifications and radio channels, as well as encryption. Motorola Solutions is the only provider that can supply the encryption for the Motorola system used by the police department and many of the radio add-on features will make Richmond Police Department's radios compatible with not only neighboring cities, but neighboring counties as well – Solano County being the latest to comply.

City staff is recommending the urgent approval of the purchase so that the County's Department of Information Technology can prepare to install the required county software, and so that the City of Richmond's Public Works maintenance team can schedule to install the mobile units in the police vehicles when they arrive.

**DOCUMENTS ATTACHED:**

- Attachment 1 – Motorola Quotation
- Attachment 2 – Sole Source



## RICHMOND POLICE DEPT

APX6000's

11/30/2022

11/30/2022

RICHMOND POLICE DEPT  
PO BOX 4046  
RICHMOND, CA 94804

RE: Motorola Quote for APX6000's  
Dear Michael Schlemmer,

Motorola Solutions is pleased to present RICHMOND 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.

This information is provided to assist you in your evaluation process. Our goal is to provide RICHMOND POLICE DEPT with the best products and services available in the communications industry. Please direct any questions to Michael Larson at [Michael.Larson@motorolasolutions.com](mailto:Michael.Larson@motorolasolutions.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,

Michael Larson

Billing Address:  
 RICHMOND POLICE DEPT  
 PO BOX 4046  
 RICHMOND, CA 94804  
 US

Quote Date:11/30/2022  
 Expiration Date:01/31/2023  
 Quote Created By:  
 Michael Larson  
 Michael.Larson@  
 motorolasolutions.com

End Customer:  
 RICHMOND POLICE DEPT  
 Michael Schlemmer  
 mschlemmer@richmondpd.net  
 +1 510 620 6660

Line #	Item Number	Description	Qty	List Price	Sale Price	Ext. Sale Price
	APX™ 6000 Series	APX6000				
1	H98UCD9PW5BN	APX6000 7/800 MHZ MODEL 1.5 PORTABLE	170	\$3,213.00	\$2,345.49	\$398,733.30
1a	G996AU	ADD: PROGRAMMING OVER P25 (OTAP)	170	\$110.00	\$80.30	\$13,651.00
1b	Q361AR	ADD: P25 9600 BAUD TRUNKING	170	\$330.00	\$240.90	\$40,953.00
1c	Q58AL	ADD: 3Y ESSENTIAL SERVICE	170	\$121.00	\$121.00	\$20,570.00
1d	QA00580AC	ADD: TDMA OPERATION	170	\$495.00	\$361.35	\$61,429.50
1e	Q498AY	ENH: ASTRO 25 OTAR W/ MULTIKEY	170	\$814.00	\$594.22	\$101,017.40
1f	H38BT	ADD: SMARTZONE OPERATION	170	\$1,320.00	\$963.60	\$163,812.00
1g	Q806BM	ADD: ASTRO DIGITAL CAI OPERATION	170	\$567.00	\$413.91	\$70,364.70
1h	Q629AK	ENH: AES ENCRYPTION AND ADP	170	\$523.00	\$381.79	\$64,904.30
2	PMNN4485A	BATT IMPRES 2 LIION R IP68 2550T	170	\$160.60	\$120.45	\$20,476.50



Any sales transaction following 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 Motorola's Standard Terms and Conditions of Sales and Supply shall govern the purchase of the Products.

Motorola Solutions, Inc.: 500 West Monroe, United States - 60661 - #: 36-1115800

Line #	Item Number	Description	Qty	List Price	Sale Price	Ext. Sale Price
3	PMMN4069AL	MICROPHONE,IMPRES RSM, 3.5MM JACK, IP55	170	\$143.64	\$114.90	\$19,533.00
4	NNTN8860A	CHARGER, SINGLE-UNIT, IMPRES 2, 3A, 115VAC, US/NA	170	\$169.56	\$127.17	\$21,618.90
	APX™ 6500 / Enh Series	ENHANCEDAPX6500				
5	M25URS9PW1BN	APX6500 ENHANCED 7/800 MHZ MOBILE	135	\$3,253.00	\$2,374.69	\$320,583.15
5a	G996AS	ENH: OVER THE AIR PROVISIONING	135	\$110.00	\$80.30	\$10,840.50
5b	GA00250AA	ADD: WIFI/GNSS STUBBY ANTENNA LMR240	135	\$110.00	\$80.30	\$10,840.50
5c	GA00580AA	ADD: TDMA OPERATION	135	\$495.00	\$361.35	\$48,782.25
5d	G51AU	ENH: SMARTZONE OPERATION APX6500	135	\$1,320.00	\$963.60	\$130,086.00
5e	G67DT	ADD: REMOTE MOUNT E5 APXM	135	\$327.00	\$238.71	\$32,225.85
5f	G78AT	ENH: 3 YEAR ESSENTIAL SVC	135	\$176.00	\$176.00	\$23,760.00
5g	G298AS	ENH: ASTRO 25 OTAR W/ MULTIKEY	135	\$814.00	\$594.22	\$80,219.70
5h	B18CR	ADD: AUXILIARY SPKR 7.5 WATT APX	135	\$66.00	\$48.18	\$6,504.30
5i	G843AH	ADD: AES ENCRYPTION AND ADP	135	\$523.00	\$381.79	\$51,541.65
5j	G444AH	ADD: APX CONTROL HEAD SOFTWARE	135	\$0.00	\$0.00	\$0.00
5k	G335AW	ADD: ANT 1/4 WAVE 762-870MHZ	135	\$15.00	\$10.95	\$1,478.25
5l	G806BL	ENH: ASTRO DIGITAL CAI OP APX	135	\$567.00	\$413.91	\$55,877.85
5m	GA01670AA	ADD: APX E5 CONTROL HEAD	135	\$717.00	\$523.41	\$70,660.35
5n	W22BA	ADD: STD PALM MICROPHONE APX	135	\$79.00	\$57.67	\$7,785.45



Line #	Item Number	Description	Qty	List Price	Sale Price	Ext. Sale Price
50	G361AH	ENH: P25 TRUNKING SOFTWARE APX	135	\$330.00	\$240.90	\$32,521.50
Subtotal						\$1,880,770.90
Estimated Tax						\$183,375.16
Grand Total				<b>\$2,064,146.06(USD)</b>		

Notes:





# APX 6500

SINGLE-BAND P25 MOBILE RADIO



## STAY INFORMED. STAY SAFE.

You may not know what the next call will entail, but you do know that your team needs communication they can count on. Whether on a motorcycle, in a squad car or a fire truck, the rugged and compact design of the evolved APX™ 6500 mobile radio is designed to maximize the real estate in your vehicle and keep your entire agency safely connected. Now with integrated Wi-Fi, Bluetooth and SmartConnect, the APX 6500 gives you more ways to manage your radio and stay connected. And when your vehicle sustains a high impact, the radio can automatically alert dispatch.

Security is more important than ever. Criminals are testing you on the streets and over the air. Fight back with multiple levels of protection to encrypt and secure your voice and data communication against eavesdropping.

Stay connected, keep safe and secure your communications with the APX 6500 single-band mobile radio.



### GET CONNECTED AND STAY CONNECTED

When the mission takes you out of range, you risk being left in the dark. The APX 6500, equipped with SmartConnect, can reroute P25 voice and data communication over broadband via built-in Wi-Fi or a tethered LTE/satellite router. Stay connected to your P25 radio system, even when outside of P25 coverage.



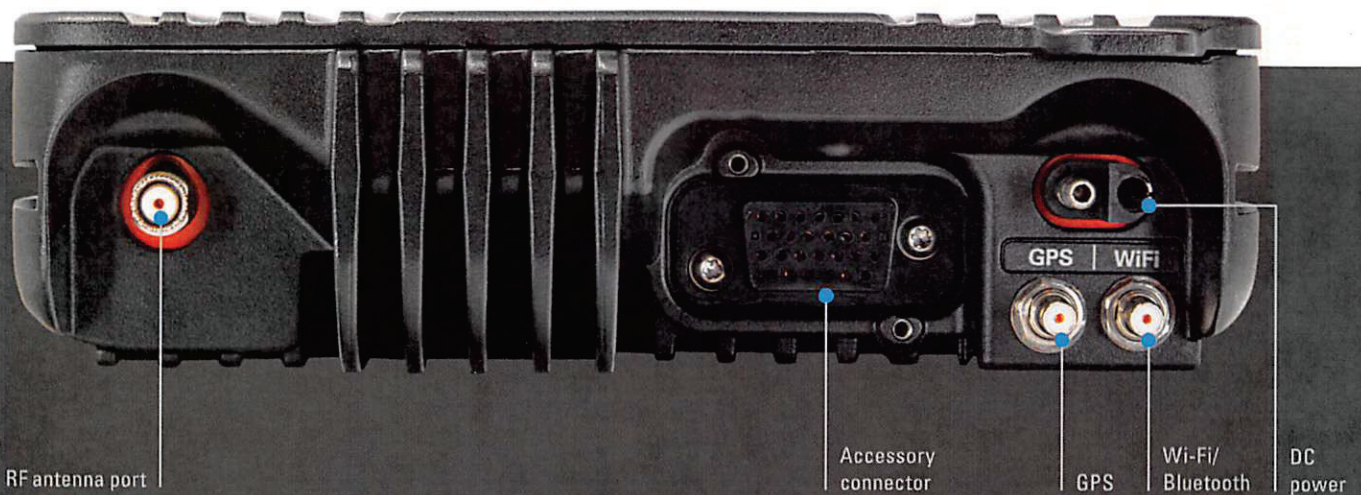
### VOICE AND DATA, ALL AT ONCE

Packed with all the connections you need, the APX 6500 keeps your team in touch and within reach of over-the-air updates. Receive new codeplugs, firmware updates and software features at the speed of Wi-Fi—without interruptions to voice communications.



### FAST INFORMATION RETRIEVAL

Running a routine database queries doesn't need to slow you down. Simply press a button on the keypad microphone and ask ViQi for the information you need. Keep your eyes on the situation and free up dispatchers to focus on more critical events. Move intelligence faster than ever with ViQi.



### KEEP VOICE AND DATA PROTECTED

The APX 6500 secures voice and data using multiple hardware encryption algorithms and the ability to rekey over the air, so it's protected from scanners and eavesdroppers. What's more, P25 Radio Authentication ensures only valid users can access the system while the available two-factor authentication secures database logins.



### FLEXIBLE, EASY INSTALLATION

The small and light form-factor of the APX 6500 allows for easy installation across a growing ecosystem of vehicles and installations. Users can choose one of several interchangeable control heads to best fit their need. Dual control head configuration enables radio operation from multiple locations within the same vehicle, such as a large fire truck.



### ALL THE SUPPORT YOU NEED

Motorola Solutions offers three levels of service plans – Essential, Advanced and Premier. From simple support for technical troubleshooting to a complete transfer of optimization and maintenance services to Motorola Solutions, you choose the level of support that suits you best.

## O2 CONTROL HEAD

### EXTREME USABILITY

The O2 control head provides rugged simplicity for efficient and confident communication. Extreme controls with easy to read color display and a built-in 7.5 watt speaker provides clear visual and audible user experiences. Available in high impact green or black.



## O3 HANDHELD CONTROL HEAD

### HANDHELD FLEXIBILITY

The O3 corded control head fits all your mobile controls in your hand. With the O3 your radio controls are never out of reach.



# APX 6500 COMPATIBLE CONTROL HEADS\*

Dedicated volume and channel knobs for quick control



Full color display with night mode and intelligent lighting

Multi-function channel/volume knob



## E5 CONTROL HEAD

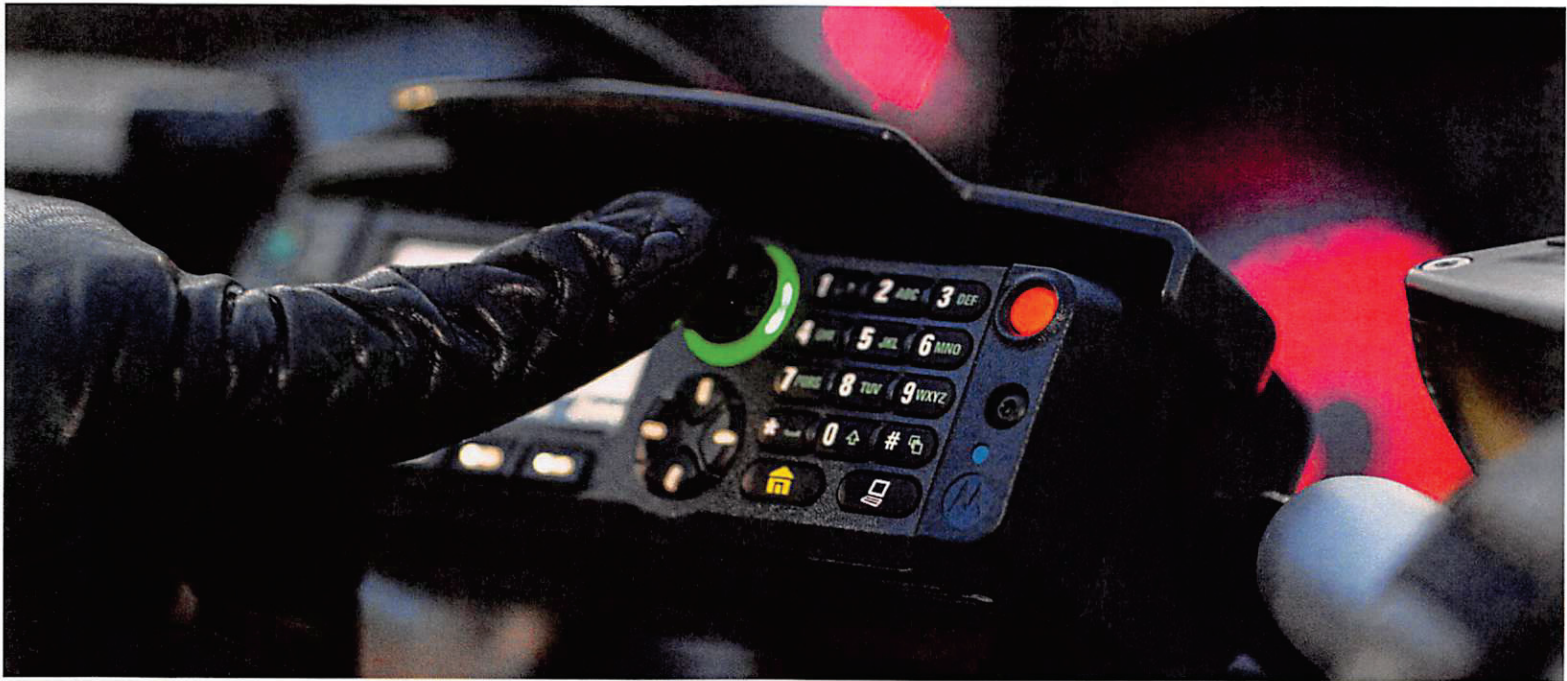
### UNMATCHED READABILITY. OPTIMIZED USABILITY.

A bright color display and intelligent lighting makes the E5 easy to read under any condition while the optimized tactility and button placement reduces inadvertent actuations.

## O7 CONTROL HEAD

### INTEGRATED MULTI-FUNCTIONALITY

The O7 is a sophisticated control head with a color display and built-in keypad. It can integrate your radio vehicle control into a single ergonomic interface and supports dual radio installations.



# FEATURES

## GENERAL FEATURES

Channel Capacity	1,000 channels standard, expandable to 3,000 channels
Encryption Algorithms	256-bit AES, ADP, DES, DES-XL, DES-OFB, DVP-XL

## OPERATING MODES

Digital Trunking: 9600 Baud APCO P25 Phase 1 FDMA and Phase 2 TDMA
Analog Trunking: 3600 Baud SmartNet®, SmartZone®, Omnilink
Digital Conventional: APCO 25
Analog Conventional: Analog MDC 1200, Quik Call II System Configurations
SmartConnect Connectivity

## INTEGRATED WI-FI, GPS AND DATA CONNECTIVITY

Wi-Fi 802.11 b/g/n with up to 20 Wi-Fi networks provisioned in the radio <sup>1</sup>
Data Modem Tethering <sup>1</sup>
ASTRO 25 Integrated Voice and Data
Enhanced Data <sup>1</sup>
Integrated GPS/GLONASS for Outdoor Location Tracking
Mission Critical Geofence <sup>1</sup>
Personnel Accountability <sup>1</sup>
SmartConnect <sup>1</sup>
ViQi Virtual Partner <sup>1</sup>
Bluetooth (Version 4.2)

## MANAGEMENT

Customer Programming Software (CPS)
Radio Management
Over-the-air Programming (OTAP) <sup>1</sup>

## SECURITY

Tactical Inhibit <sup>1</sup>
P25 Authentication <sup>1</sup>
Software Key <sup>1</sup>
Single-key ADP Encryption <sup>1</sup>
Multikey for 128 keys and multi-algorithm <sup>1</sup>
Over-the-air Rekeying (OTAR) <sup>1</sup>

## GPS/GNSS SPECIFICATIONS

Channels	12
Tracking Sensitivity	-164 dBm
Accuracy <sup>2</sup>	<5 meters (95%)
Cold Start <sup>2</sup>	<60 seconds (95%)
Hot Start <sup>2</sup>	<5 seconds (95%)
Mode of Operation	Autonomous (Non-Assisted) GNSS or SBAS

<sup>1</sup> Optional <sup>2</sup> Measured conductively with >6 satellites visible at a nominal -130 dBm signal strength



### ENCRYPTION

Supported Encryption Algorithms	ADP, AES, DES, DES-XL, DES-OFB, DVP-XL
Encryption Algorithm Capacity	8
Encryption Keys per Radio	Module capable of storing 1024 keys. Programmable for 128 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 140-3 Level 3, FIPS 197

### OTHER FEATURES

Text Messaging
Radio Profiles
Dynamic Zone
Intelligent Priority Scan
Unified Call List
Instant Recall
Data Modem Connection (wired or Wi-Fi) <sup>1</sup>
12 Character RFID Asset Tracking <sup>1</sup>
Digital Tone Signaling <sup>1</sup>

### INTEGRATED WI-FI, GPS AND DATA CONNECTIVITY

Frequency Range/Band splits	WLAN (Wi-Fi): 2412 - 2472 MHz; 5180 - 5320 MHz; 5500 - 5825 MHz	
WLAN (WiFi) 802.11 b/g/n (2.4GHz) 802.11 a/n/ac (5GHz)	Security protocols	WPA-2, WPA, WEP
	SSIDs	Up to 20 pre-provisioned
Data Modem Tethering <sup>1</sup>		
Bluetooth Version 4.2	2402-2480 MHz Supports MPP Pairing <sup>2</sup> and compatible with HSP, PAN, DUN and SPP Profiles found in Off-the-shelf Bluetooth accessories. Supports up to 6 data connections and 1 audio connection.	

### SIGNALING (ASTRO 25 MODE)

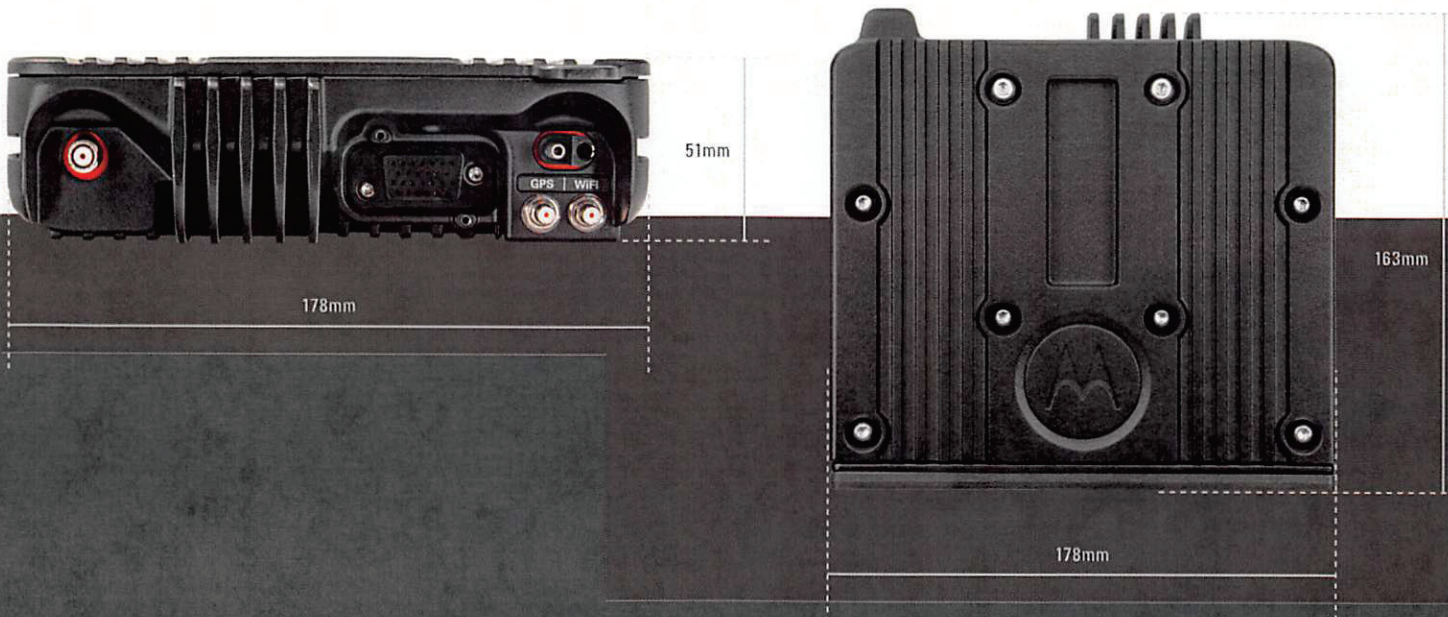
Signalling Rate	9.6 kbps
Digital ID Capacity	10,000,000 Conventional / 48,000 Trunking
Digital Network Access Codes	4,096 network site addresses
ASTRO Digital User Group Addresses	4,096 network site addresses
Project 25 – CAI Digital User Group Addresses	65,000 Conventional / 4,094 Trunking
Error Correction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

<sup>1</sup> Optional  
<sup>2</sup> For E5 Control Head only



#### DIMENSIONS AND WEIGHT

Radio Transceiver	51 x 178 x 163 mm (2.0 x 7.0 x 6.4 in)	2.18 kg (4.80 lbs)
Radio Transceiver and O2 Control Head - Dash Mount	69 x 207 x 223 mm (2.7 x 8.1 x 8.8 in)	2.43 kg (5.36 lbs)
Radio Transceiver and O5 Control Head - Dash Mount	51 x 178 x 202 mm (2 x 7 x 8.0 in)	2.24 kg (4.94 lbs)
Radio Transceiver and E5 Control Head - Dash Mount	51 x 178 x 209 mm (2.0 x 7.0 x 8.2 in)	2.24 kg (4.94 lbs)
Radio Transceiver and O7 Control Head - Dash Mount	51 x 178 x 208 mm (2 x 7 x 8.2 in)	2.24 kg (4.94 lbs)
Radio Transceiver and Remote Mount	51 x 178 x 193.6 mm (2 x 7 x 7.6 in)	2.18 kg (4.80 lbs)
O2 Control Head Remote Mount	68 x 206 x 53 mm (2.7 x 8.1 x 2.1 in)	-
O5 Control Head Remote Mount	51 x 180.3 x 64 mm (2.0 x 7.0 x 2.5 in)	-
E5 Control Head Remote Mount	51 x 178.5 x 64 mm (2.0 x 7.0 x 2.5 in)	-
O7 Control Head Remote Mount	51 x 178 x 40 mm (2.0 x 7.0 x 1.5 in)	-



# PERFORMANCE AND REGULATORY

TRANSMITTER												
	VHF		UHF R1		UHF R2		700 MHz		800 MHz		900 MHz	
Frequency Range/Bandsplits	136-174 MHz		380-470 MHz		450-520 MHz		764-776, 794-806 MHz		806-825, 851-870 MHz		896-902, 935-941 MHz	
Rated RF Output Power (Adjustable)	1-50 W		1-40 W		1-45 W		3-30 W		3-35 W		1-30 W	
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	
Emissions	Conducted -85 dBc	Radiated -10 dBm	Conducted -85 dBc	Radiated -20 dBm	Conducted -85 dBc	Radiated -20 dBm	Conducted -75/-85 dBc	Radiated -20/-40 dBm	Conducted -75 dBc	Radiated -20 dBm	Conducted -70 dBc	Radiated -20 dBm
Modulation Limiting (12.5/20/25 kHz)	±5/±2.5 kHz		±5/±2.5 kHz		±5/±2.5 kHz		±5/±2.5 kHz		±5/±2.5 kHz		±2.5 kHz (12.5kHz only)	
Modulation Fidelity (C4FM) 12.5 kHz Digital Channel	2.5%		1.50%		1.50%		1.50%		1.50%		1.50%	
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)	
FM Hum & Noise (12.5 kHz/25 kHz)	-52 dB / -53 dB		-50 dB / -53 dB		-50dB / -53dB		-48 dB / -50 dB		-48 dB / -50 dB		-45 dB (12.5kHz only)	
Audio Distortion (12.5 kHz/25 kHz)	0.50%		0.50%		0.50%		0.50%		0.50%		0.80% (12.5kHz only)	

RECEIVER												
	VHF		UHF R1		UHF R2		700 MHz		800 MHz		900 MHz	
Frequency Range/Bandsplits	136-174 MHz		380-470 MHz		450-520 MHz		764-776 MHz		851-870 MHz		935-941 MHz	
Channel Spacing	12.5/25 kHz		12.5/25 kHz		12.5/25 kHz		12.5/25 kHz		12.5/25 kHz		12.5 kHz	
Maximum Frequency Separation	Full Bandsplit		Full Bandsplit		Full Bandsplit		Full Bandsplit		Full Bandsplit		Full Bandsplit	
Audio Output Power at Rated/Max	7.5 / 15 W		7.5 / 15 W		7.5 / 15 W		7.5 / 15 W		7.5 / 15 W		7.5 / 15 W	
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	
Analog Sensitivity (12db SINAD)	Pre-Amp -123 dBm (0.158 µV)	Standard -119 dBm (0.251 µV)	Pre-Amp -123 dBm (0.158 µV)	Standard -119 dBm (0.251 µV)	Pre-Amp -123 dBm (0.158 µV)	Standard -119 dBm (0.251 µV)	-121 dB (0.199 µV)		-121 dB (0.199 µV)		-120 dBm (0.224 µV)	
5% BER	Pre-Amp -123 dBm (0.158 µV)	Standard -119 dBm (0.251 µV)	Pre-Amp -123 dBm (0.158 µV)	Standard -119 dBm (0.251 µV)	Pre-Amp -123 dBm (0.158 µV)	Standard -119 dBm (0.251 µV)	-121.5 dB (0.188 µV)		-121.5 dB (0.188 µV)		-121 dBm (0.199 µV)	
Selectivity (12.5 kHz / 25 kHz / 30 kHz)	77 dB / 89 dB / 90 dB		72 dB / 83 dB / -		72 dB / 83 dB / -		75 dB / 85 dB / -		75 dB / 85 dB / -		74 dB (12.5kHz only)	
Intermodulation Rejection (12.5 kHz / 25 kHz)	Pre-Amp 84 dB	Standard 86 dB	Pre-Amp 82 dB	Standard 86 dB	Pre-Amp 82 dB	Standard 86 dB	82 dB		82 dB		82 dB	
Spurious Rejection	95 dB		93 dB		93 dB		91 dB		91 dB		91 dB	
FM Hum & Noise (12.5 kHz / 25 kHz)	-50 dB / -59 dB		-50 dB / -55 dB		-50 dB / -55 dB		-50 dB / -59 dB		-50 dB / -59 dB		-50 dB (12.5kHz only)	
Audio Distortion (12.5 kHz / 25 kHz)	1.20%		1.50%		1.50%		1.20%		1.20%		1.20% (12.5kHz only)	

POWER AND BATTERY DRAIN												
	VHF		UHF R1		UHF R2		700 MHz		800 MHz		900 MHz	
Frequency Range / Bandsplits	136-174 MHz		380-470 MHz		450-520 MHz		764-775, 794-806 MHz		806-825, 851-870 MHz		896-902, 935-941 MHz	
RF Power Output	1-50 W		1-40 W		450-485 MHz: 1-45 W 485-512 MHz: 1-40 W 512-520 MHz: 1-25 W		3-30 W		3-35 W		896-901 MHz: 1-30W 901-902 MHz: 1-3W 935-940 MHz: 1-30W 940-941MHz:1-3W	
Operation	13.8 V DC ±20% Negative Ground		13.8 V DC ±20% Negative Ground		13.8 V DC ±20% Negative Ground		13.8 V DC ±20% Negative Ground		13.8 V DC ±20% Negative Ground		13.8 V DC ±20% Negative Ground	
Standby at 13.8V	0.85 A		0.85 A		0.85 A		0.85 A		0.85 A		0.85 A	
Receive Current at Rated Audio at 13.8V	3.2 A		3.2 A		3.2 A		3.2 A		3.2 A		3.2 A	
Transmit Current (A) at Rated Power	8 A @ 15 W 13 A @ 50 W		11 A @ 40 W 8A @ 15 W		11 A @ 40 W 8A @ 15 W		8 A @ 15 W		8 A @ 15 W 12 A @ 35 W		10 A @ 30 W 5 A @ 3 W	



**ENVIRONMENTAL**

Operating Temperature	-30°C/+60°C
Storage Temperature	-40°C/+85°C
Humidity	Per MIL-STD
ESD	IEC 61000-4-2
Water and Dust Intrusion (w/ O2 control head)	IP56, MIL-STD

**RADIO MODEL NUMBER**

VHF	M25KSS9PW1BN
UHF R1	M25QSS9PW1BN
UHF R2	M25SSS9PW1BN
700/800	M25URS9PW1BN
800/900	M25VRS9PW1CN

**FCC/IC TYPE ACCEPTANCE ID**

FCC/IC ID	Band and Power Level
FCC ID: AZ492FT7141 ISED ID: 109U-92FT7141	896-902MHz (1-30W) 935-941MHz (1-30W)
FCC ID: AZ492FT7124 IC ID: 109U-92FT7124	764-776 MHz (3-30 W) 794-806 MHz (3-30 W) 806-824 MHz (3-35 W) 851-870 MHz (3-35 W)
FCC ID: AZ492FT7130 IC ID: 109U-92FT7130	136-174 MHz (1-50 W)
FCC ID: AZ492FT7129 IC ID: 109U-92FT7129	380-470 MHz (1-40 W)
FCC ID: AZ492FT4967 ISED ID: 109U-92FT4967	450-520 MHz (1-45 W) 485-512 MHz (1-40 W) 512-520 MHz (1-25 W)

**MOBILE MILITARY STANDARDS 810, C, D, E, F, G & H**

	MIL-STD 810C		MIL-STD 810D		MIL-STD 810E		MIL-STD 810F		MIL-STD 810G		MIL-STD 810H	
	Method	Proc./Cat.	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	I/II	500.6	II	500.6	II
High Temperature	501.1	I, II	501.2	I/A1, II/A1	501.3	I/A1, II/A1	501.4	I/Hot, II/Hot	501.6	I/A1, II/A1	501.7	I/A1, II/A1
Low Temperature	502.1	I	502.2	I/C3, II/C1	502.3	I/C3, II/C1	502.4	I/C3, II/C1	502.6	I/C3, II/C1	502.7	I/C3, II/C1
Temperature Shock	503.1	I	503.2	I/A1C3	503.3	I/A1C3	503.4	I	503.6	I/C	503.7	I/C
Solar Radiation	505.1	II	505.2	I	505.3	I	505.4	I	505.6	I/A1	505.7	I/A1
Rain	506.1	I, II	506.2	I, II	506.3	I, II	506.4	I, III	506.6	I, III	506.6	I, III
Humidity	507.1	II	507.2	II	507.3	II	507.4	-	507.6	II/Aggravated	507.6	II/Aggravated
Salt Fog	509.1	I	509.2	I	509.3	I	509.4	-	509.6	-	509.7	-
Blowing Dust	510.1	I	510.2	I	510.3	I	510.4	I	510.6	I	510.7	I
Blowing Sand	-	-	510.2	II	510.3	II		II	510.6	II	510.7	II
Vibration	514.2	VIII, F, W	514.3	I/10, II/3	514.4	I/10, II/3	514.5	I/24	514.7	I/24	514.8	I/24, II/5
Shock	516.2	I, III, V	516.3	I, V, VI	516.4	I, V, VI	516.5	I, V, VI	516.7	I, V, VI	516.8	I, V, VI



For more information, please visit  
[www.motorolasolutions.com/apx](http://www.motorolasolutions.com/apx)










Motorola Solutions, Inc. 500 West Monroe Street, Chicago, IL 60661 U.S.A. 800-367-2346 [motorolasolutions.com](http://motorolasolutions.com)

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# KEY FEATURES SET (O5 VS E5)

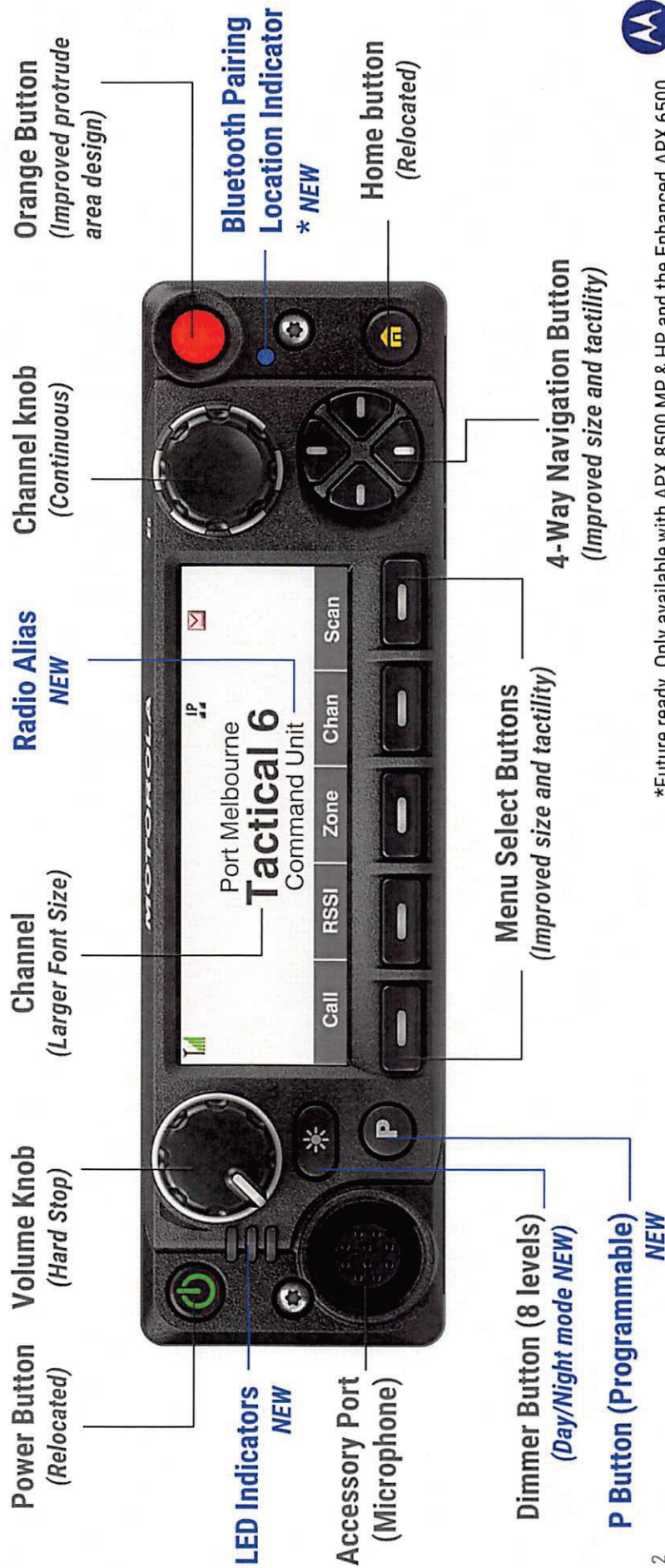
E5 is better  
 Same  
 O5 is better

Specifications	O5	E5	Remarks
<b>Display Characteristics</b> Type Luminance Resolution Pixel Pitch Active Area Icons Text Strings Programmable Soft Keys Viewing Angle Lens Polarized Sunglasses Display Operating Temperature Display Storage Temperature	 <p>3.2" Transflective Monochrome  <i>Spec defined is different</i>                      320 X 83 pixels                      0.235 x 0.235                      75.2 mm x 19.51 mm                      Monochrome                      2 line with 14 characters                      1 line of 5 soft keys  <i>Spec defined is different</i>                      Polycarbonate                      Not visible at all angles                      -30--+70 deg C                      -40--+85 deg C</p>	 <p>3.3" TFT Transmissive Color                      1,000 nits                      480 X 160 pixels                      0.165 x 0.165                      79.9 mm x 26.6 mm                      Color                      3 line with 14 characters                      1 line of 5 soft keys                      70/70/70/70                      Gorilla Glass with AR                      Visible at all angles                      -30--+80 deg C                      -40--+85 deg C</p>	<p>  Larger display   Brighter display   Higher resolution   Better Viewing Distance   Larger display   Better readability   Ability to show radio alias   Better viewing angle   Better anti-reflection   Better readability   Better display robustness                 </p> <p style="text-align: center; background-color: #4F7942; color: white; padding: 5px;"> <b>Much Better Readability Under Direct Sunlight</b> </p>
<b>Night Mode</b> 	No	Yes	Better readability at night
<b>Channel Backlight Color</b> 	No	Yes, new feature	Channel-at-a-glance
<b>Dedicated Controls</b> Emergency Volume Channel Home P-button  Dimmer	Yes Yes Yes Yes No Yes, 4 levels	Yes Yes Yes Yes Yes, new feature Yes, 8 levels	<p>  Larger and more protrude   Keep Dual Knob solution   Keep Dual Knob solution   Relocated for better ergonomics   More programmable button   More dimming levels                 </p> <p style="text-align: center; background-color: #4F7942; color: white; padding: 5px;"> <b>Enhancement Per Voice of Customer</b> </p>
<b>Dual Radio</b> 	No	Yes, enhanced from O7	Ability to see both channels at the same time
<b>Bluetooth MPP Pairing</b> 	No	Yes, Hardware Ready	Future ready to support APX Mobile Bluetooth feature
<b>IP Rating</b>	IP54	IP56	

# NEW APX E5 CONTROL HEAD

REPLACEMENT FOR 05 CONTROL HEAD

— **New feature**  
 — **Upgraded legacy feature**



\*Future ready. Only available with APX 8500 MP & HP and the Enhanced APX 6500

## APX E5 CONTROL HEAD

UPGRADED FEATURES, ALL INFORMATION AT-A-GLANCE

- **3.3" LCD Color display with Anti-Reflective Gorilla Glass Lens**  
Enhanced readability under direct sunlight. Polarized sunglass friendly in all angles. Ability to show radio alias on display screen. Support APX Dual-Radio feature.
- **Day / Night Mode**  
Up to 8 dimming levels. Ability to assign color backlights to different talkgroups. Enhanced Intelligent Lighting colors design.
- **Intuitive User Interface Design**  
Keep volume and channel knobs separated. Relocate Home, Dim and Power On/Off buttons to avoid inadvertent actuation. Additional programmable "P" button and TX/RX LED indicators.
- **Backward Compatibility**  
Support APX 8500, APX 7500, 6500 and APX 6500 LI. Support Dash, Remote, Motorcycle and Multi-Control Heads configuration. Keep the same CH screw location and mounting bracket to ease of installation



# CHANNEL BACKLIGHT COLOR

## NEW FEATURE, CHANNEL-AT-A-GLANCE

- **Use Cases:**
  - User is able to assign colors to different channels in CPS. This allows the user to be able to recognize the “channel-at-a-glance” through the “channel color” they assign to the specific channel
  - If the user has more than one radio, they are very likely to be on different channels and that’s why they have multiple radios. This means that the user wants to assign a radio for a specific channel. In a broader sense, color has a code for people who they are talking to. They talk to fire, police etc

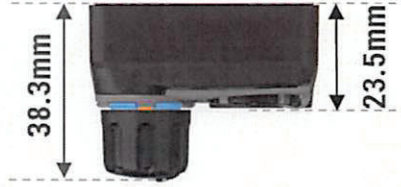
- **This feature is compatible with Intelligent Lighting feature**



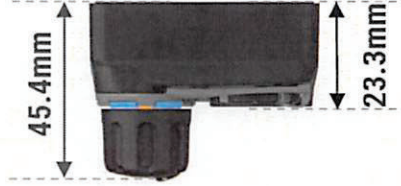
# APX E5 CONTROL HEAD

FORM FACTOR

## 05 CONTROL HEAD



## E5 CONTROL HEAD





# City of Richmond Sole Source Justification

**THIS FORM MUST BE COMPLETED AND APPROVED PRIOR TO ANY PURCHASE**

**Contact the Purchasing Division and discuss your rationale before completing this form. If Purchasing can help you make this a competitive purchase, then this form will not be required.**

Attach this completed/approved form to requisitions when competitive quotes/bids/proposals are not solicited. (Required for requisitions > \$3,000)

**Requested Sole Source Supplier:**

Company Name: Motorola Solutions Contact Name: Mike Larson

Address: 500 W Monroe Stree

City: Chicago State: IL Zip Code: 60661

Phone Number (530) 333-7584 E-Mail michael.larson@motorolasolutions.com

Estimated Cost Per Year: \$ 2,064,146.06 Funding Source (Account String) 01191021-400701

Duration of Contract? Product purchase only

Is the recommended company the manufacturer? Yes  No

Does the manufacturer sell the item(s) through distributors? Yes  No

**Description of Product or Service:**

*Describe the full scope of work or service contemplated including installation if required; items should include brand, model and part number if applicable; (if additional space is needed, include them in a separate page)*

For purchase of Motorola portable and mobile radios used by the Police Department. This includes the mandatory encryption software needed for each radio to be implemented by June 2023.

**Sole Source Rationale**

Explain why the recommended company is the only company that can meet the requirement. Address the following: Are there any other companies who can do this job? What condition (e.g. technological superiority, or performance risks, etc.) exists so that the recommended company has a significant advantage over any other company who can do this job?

It is important to sufficiently address the key reason for awarding an order/contract without soliciting competitive bids. The rationale must be clear and convincing, avoiding generalities and unsupported conclusions.

The initial selection of Motorola Solutions Inc. to be sole provider of radio equipment was made by the East Bay Regional Communications Systems Authority (EBRCSA) of which the City of Richmond is a member. The Richmond Police Department is required to meet the encryption standards in compliance with the California Department of Justice Security Policy and replace all current communications equipment. Motorola Solutions is the only provider which can supply the encryption for the Motorola system used by the police department. (continued on page 4)

*(if additional space is needed, include them in a separate page)*

### Complete the following checklist

A specific contractor is the only source of the required item because (check all that apply):

- The required items are **proprietary to the Contractor**, and contractor solely transacts (sells) direct to the customer. (There are no dealers or distributors for contractor).
- The required items are **proprietary to the Contractor**, and contractor does not sell direct to the customer. Contractor solely distributes the item or service through only one dealer or distributor in the United States. (There are no dealers or distributors for contractor).

**Note:** If item or service is available from more than one source, the item or service may be treated as proprietary, but must be competitively solicited from multiple (two or more) sources.

- A specific item is needed:
  - to be compatible or interchangeable with existing hardware,
  - as spare or replacement hardware, or
  - for the repair or modification of existing hardware.
- Federal or state grant names vendor as condition of funding. (Attach copy of grant that names vendor)
- There is a **substantial technical risk** in contracting with any other contractor, (e.g., only one contractor has been successful to date in implementing a difficult manufacturing process). *In a brief explanation, provide supporting evidence of why other contractors are considered to be unable to overcome the substantial technical risk.*

Price of each radio includes programing them to our specifications and radio channels, as well as, encryption. Motorola Solutions is the only provider which can supply the encryption for the Motorola system used by the police department.

- Continuation of prior Work** – Additional item, service or work required, but not known to have been needed when the original order was placed with vendor, and it is not feasible or practicable to contract separately for the additional need.

EBRCSA maintains our dispatch radio equipment consoles, and if we switched vendors of our portable and mobile units, we would need to upgrade the dispatch center's equipment as well, and the interoperability with neighboring cities would be affected - including El Cerrito which pays for dispatch services provided by the call center.

*(if additional space is needed, include them in a separate page)*

I acknowledge the City's requirements for soliciting competitive quotes/bids for purchases over \$3,000.00 and the criteria for justification for Sole Source purchases. I have gathered the required technical information, have made a concerted effort to review comparable/equal equipment (e.g., market research), and further affirm that there is no conflict of interest involved in the selection made.

Department: Communications Center

Requester Name and Title: Michael Schlemmer Communications Center Manager

*Note: Requester must be able to defend this justification.*

Date: \_\_\_\_\_ Phone: \_\_\_\_\_  
Department Director (Print) BISA French (Sign) [Signature] Date: 2/1/23

-----  
**Submit completed form to the Purchasing Division (Prior to submission to City Manager)**

**Finance Director:**

APPROVED: [Signature] DATE: 2/2/23

NOT APPROVED: \_\_\_\_\_ COMMENTS: \_\_\_\_\_

\_\_\_\_\_  
City Manager  
(Under \$10,000.00)

\_\_\_\_\_  
City Clerk Attesting to Council Approval  
(Over \$10,000.00) (Copy of Minutes may be substituted)

**Note:** Richmond Municipal Code Section 2.52.326 Sole Source Procurement requires final approval by the City Manager and/or City Council

**PROCEDURE**

Sole Source/Brand purchase/service are exceptions to the normal bidding process and require a detailed justification. In processing Sole Source requests for supplies, services and/or equipment, the Purchasing Division adheres to and is governed by the principles set forth in City of Richmond Municipal Code Section 2.52.326 Sole Source Procurement.

If you are requesting a particular vendor, brand or product, you must make this fact clear on your Sole Source form. Your request will then be restrictive and non-competitive, and will fall into a sole source category. If the sole source justification is approved, the requisition can be expedited without the normal bidding requirements.

Such a request should not be made unless you are confident that your request is reasonable and appropriately justified to meet the City's requirements and withstand any possible audit. The City's requirements and the format for submitting such requests are contained herein. Sole Source form must be signed by authorized department representative(s). The certification will remain on file for audit purposes.

The following factors **DO NOT** apply to sole source requests and should not be included in your sole source justification. They will not be considered and only tend to confuse the evaluation process.

1. Personal preference for product or vendor.
2. Cost, vendor performance, and local service (these are generally considered award factors in competitive bidding).
3. Features which exceed the minimum department requirements.

(Continued from page 1)

In 2008, a bid was put out by EBRCSA and Motorola was the only viable vendor that responded. Once Motorola was selected as the vendor, our county's Dept. of IT (which repairs and maintains our equipment) was trained specifically on Motorola equipment and is the only equipment that they can repair due to Motorola's proprietary engineering (Alameda County's radio shop is set up the same way). On top of that, the infrastructure that was built up by EBRCSA can only be used with Motorola, other vendors' radios have limited functionality and cannot use the majority of Motorola's infrastructure and built-in features. Motorola's durability, battery interchangeability, speaker, mics, and county software plugs, meet all of the standards for the Motorola designed system that EBRCSA uses.