State of Rhode Island
Department of Administration / Division of Purchases
One Capitol Hill, Providence, Rhode Island 02908-5855
Tel: (401) 574-8100 Fax: (401) 574-8387

ADDENDUM #1

Date: 2/12/15

RFQ # 7549323

TITLE: HEAVY DUTY TANDEM DUMP TRUCKS (TEN WHEEL)

SUBMISSION DEADLINE: MARCH 11, 2015 AT 3:00 P.M.

1. **CLARIFICATION: MANDATORY PRE-BID CONFERENCE REFERENCED ON PAGE 6 OF 26 SHOULD READ 2/20/15 AT 10:00 A.M.**

2. **REVISION: MOTOROLA ASTRO XTL 1500 DIGITAL RADIO SPECIFICATIONS WHICH WERE INADVERTENTLY OMITTED FROM THE RFP ARE ATTACHED TO THIS ADDENDUM FOR INCLUSION IN THE RFP PACKAGE.**

Lisa Hill

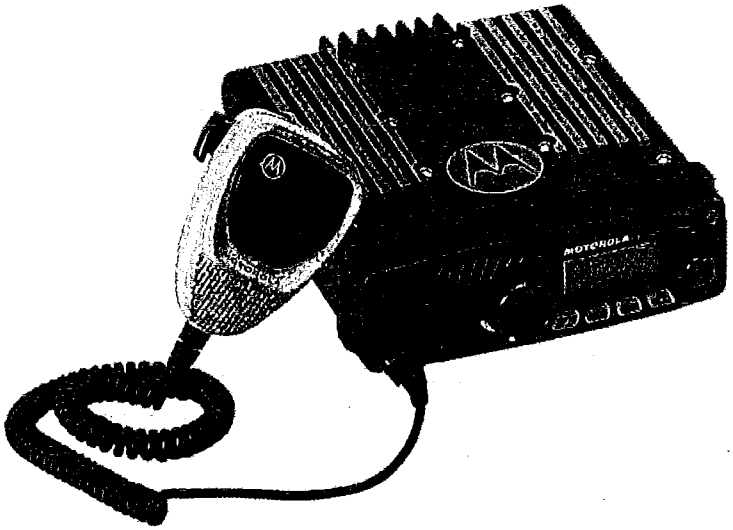
Lisa Hill
Chief Buyer

SPECIFICATION SHEET

MOTOROLA

ASTRO® XTL™ 1500

Digital Mobile Radio



MODEL FEATURES

Frequency Bands
- 136-174 MHz
- 380-470 MHz
- 450-520 MHz
- 764-870 MHz

Power Levels
- 10-50 Watt (136-174 MHz)
- 10-40 Watt (380-470 MHz)
- 10-45 Watt (450-520 MHz)
- 10-35 Watt (764-870 MHz)

48 Channels (Standard)

Dual mode operation (ASTRO Digital and Analog)

9600 or 3600 Baud features

Project 25 capability on Conventional and Trunking systems

Project 25 compliance interoperable voice signaling features

Bandwidth Receiver
- 12.5/25/30 kHz (analog) – 136-174 MHz
- 12.5/25 kHz (analog) – 380-470 MHz and 450-520 MHz
- 12.5/20/25 kHz (analog) – 764-870 MHz

12.5 kHz bandwidth receiver (digital)

4 Programmable buttons

Emergency button

Dash mount

Meets Military Specs 810 (C,D, E and F)

Utilizes Windows®-based customer programming software

Built in FLASHport™ support

Optional Keypad microphone

Internal Speaker

Text Messaging

OTAP (Over the air programming)

AVAILABLE WITH SOFTWARE ENHANCEMENT PACKAGE

512 Channels

Encryption capability (ADP)

Integrated voice and data capable

Motorola's XTL 1500 Project 25 compliant mobile radio is tough and well suited for users in a construction, utility, petroleum, and local law enforcement environment. Taking into consideration your work environment and various job responsibilities, this robust mobile radio will support the type of consistent, high quality communication you need.

The XTL 1500 digital mobile radio supports APCO Project 25 and is available in 136-174 MHz, 380-470 MHz, 450-520 MHz 764-870 MHz frequency bands and supports a subset of the accessories common to the XTL 2500 mobile radio.

The XTL 1500 digital mobile radio is specifically designed to meet the needs of your organization. When you want high performance, quality, and reliability in your daily communications, the XTL 1500 digital mobile radio is the radio of choice.

SPECIFICATION SHEET

ASTRO® XTL™ 1500
Digital Mobile Radio

GENERAL PERFORMANCE SPECIFICATIONS

Frequency range	136-174 MHz 380-470 MHz 450-520 MHz 764-870 MHz
Modulation	C4FM of QPSK-C family (Compatible 4-Level Frequency Modulation and Compatible Quadrature Phase Shift Keying)
Protocol	
Project 25-CAI	4.4 kbps IMBE, 2.8 kbs Error Correction Coding, 2.4 kbps Embedded Signaling
Channel Bandwidth	
Analog	12.5/25/30 kHz (136-174 MHz) 12.5/25 kHz (380-470 MHz and 450-520 MHz); 12.5/20/25 kHz (764-870 MHz)
Digital	12.5 kHz

VOICE CODER

Voice Coding Method IMBE (CAI)	Improved Multi Band Excitation (IMBE)
Voice Truncation	None
Frame Re-sync Interval	180 mSec (Clear Digital Mode)
Forward Error Correction	Golay code
Error Mitigation Project 25-CAI (IMBE) Dual Level	Level 1: Extrapolates and replaces 20 mSec voice frames that exceed the error correction algorithm tolerance. Level 2: Progressive muting of 20 mSec voice frames that are too severely damaged for Level 1 replacement.
Code Book Structure	APCO Project 25 (IMBE): No code book

SIGNALLING (ASTRO 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.

SPEAKER

Dimensions	5.5" x 5.5" x 2.5" (139.7 x 139.7 x 63.5 mm) (Excluding mounting bracket)
Weight	1.5 lbs (0.7 kg)

MOBILE

Dimensions	Radio Transceiver 2" x 7" x 7.8" (51 x 179 x 197 mm) Control Head 2.6" x 7.3" x 2.7" (65 x 185 x 69 mm) Radio Transceiver and Control Head 2.6" x 7.3" x 9.8" (65 x 185 x 248 mm)
Weight	Radio Transceiver and Control Head 5.2 lbs (2.34 kg) (764-870 MHz and 136-174 MHz) 5.2 lbs (2.32 kg) (380-470 MHz and 450-520 MHz)

SPECIFICATION SHEET

ASTRO® XTL™ 1500
Digital Mobile Radio

TRANSMITTER

Frequency	764-776 MHz 794-806 MHz 806-825 MHz 851-870 MHz		380-470 MHz (Range 1) and 450-520 MHz (Range 2)		136-174 MHz	
RF Power	10-30W (764-806 MHz) 10-35W (806-870 MHz)		10-45W (450-500 MHz) 10-40W (500-512 MHz) 10-25W (512-520 MHz)		10-50W	
Max Freq Separation	Full Bandsplit		Ref Above Bandsplit		Full Bandsplit	
Freq Stability Operating Freq Accuracy (–30°C to +60°C;+25°C Ref) - 700/800 & UHF (± 2 ppm (–30°C to +60°C) - VHF	1.5 ppm		2 ppm		2 ppm	
Modulation Limiting						
25/20 kHz, 25 kHz, 25/30 kHz channel	±5 kHz, +/-4 kHz (NPSPAC)		±5 kHz		±5 kHz	
12.5 kHz channel	±2.5 kHz		±2.5 kHz		±2.5 kHz	
Modulation Fidelity (C4FM) 12.5 kHz digital channel	±2.8 kHz		±2.8 kHz		±2.8 kHz	
Channel Spacing Analog	12.5/20/25 kHz		12.5/25 kHz		12.5/25/30 kHz	
FM Hum and Noise						
20/25 kHz, 25 kHz, 20/25 kHz	40 dB		45 dB		45 dB	
12.5 kHz	34 dB		40 dB		40 dB	
Emissions (GNSS=Global Navigation Satellite System)	Conducted –70 dBc –85 dBc (GNSS)	Radiated –20 dBm –40 dBm (GNSS)	Conducted –85 dBc	Radiated –20 dBm	Conducted –85 dBc	Radiated –20 dBm
Audio Response (6 dB/Octave Pre-emphasis from 300 to 3000 Hz)	+1, –3 dB (EIA)		+1, –3 dB (EIA)		+1, –3 dB (EIA)	
Audio Distortion per EIA	3%		3%		3%	

POWER AND BATTERY DRAIN

Model Type	136-174 MHz 380-470 MHz 450-520 MHz 764-870 MHz
Minimum RF Power Output	10-50 Watt (136-174 MHz) 10-40 Watt (380-470 MHz) 10-45 Watt (450-520 MHz) 10-35 Watt (764-870 MHz) 25-110 Watt (136-174 MHz) 25-110 Watt (380-470 MHz)
Operation	13.8V DC ±20% Negative Ground
Standby at 13.8V	
136-174 MHz (10-50 Watt)	0.85A
380-470 MHz (10-40 Watt)	0.85A
450-520 MHz (10-45 Watt)	0.85A
764-870 MHz (10-35 Watt)	0.85A
Receive at Rate Audio at 13.8V	
136-174 MHz (10-50 Watt)	3.2A
380-470 MHz (10-40 Watt)	3.2A
450-520 MHz (10-45 Watt)	3.2A
764-870 MHz (10-35 Watt)	3.2A
Transmit Current (A) at Rated Power (W)	
136-174 MHz (10-50 Watt)	13A (50W)
380-470 MHz (10-40 Watt)	11A (40W)
450-520 MHz (10-45 Watt)	11A (45W)
764-870 MHz (10-35 Watt)	12A (35W)

FCC TYPE ACCEPTANCE ID

Band	Output Power	Transmitter Number
136-174 MHz	10-50 W	AZ492FT3806
380-470MHz	10-40 W	AZ492FT4862
450-520 MHz	10-45 W	AZ492FT4867
764-870 MHz	10-35 W	AZ492FT5823

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	–30°C / +60°C
Storage Temperature	–55°C / +85°C
Ingress Protection	IP54 certified

SPECIFICATION SHEET

ASTRO® XTL™ 1500
Digital Mobile Radio

RECEIVER

Frequency	764-776 MHz 794-806 MHz 806-825 MHz 851-870 MHz	380-470 MHz (Range 1) and 450-520 MHz (Range 2)	136-174 MHz
Channel Spacing	12.5 / 20 / 25 kHz	12.5 / 25 kHz	12.5 / 25 / 30 kHz
Maximum Frequency Separation	Full Bandsplit	Full Bandsplit	Full Bandsplit
Option Pre-Amp	No	No	No
Analog Sensitivity			
20 dB Quieting	.30 µV	0.40 µV	0.40 µV
12 dB SINAD per EIA	.25 µV	0.30 µV	0.30 µV
Digital Sensitivity			
1% BER (12.5 kHz channel)	.30 µV	0.40 µV	0.40 µV
5% BER (12.5 kHz channel)	.25 µV	0.30 µV	0.30 µV
Intermodulation Distortion	80 dB	85 dB	85 dB
Spurious Response Rejection	90 dB	90 dB	90 dB
Audio Output Power at 3% distortion (External/Internal Speaker)	7.5 W (8 Ω ext. speaker) 3 W (int. speaker)	7.5 W (8 Ω ext. speaker) 3 W (int. speaker)	7.5 W (8 Ω ext. speaker) 3 W (int. speaker)
Adjacent Channel Rejection Selectivity (12.5 kHz/25 kHz)	65 dB / 80 dB	75 dB / 82 dB	75 dB / 82 dB
Audio Response (6 dB/Octave De-emphasis from 300 to 3000 Hz)	+1, –3 dB (EIA)	+1, –3 dB (EIA)	+1, –3 dB (EIA)

MILITARY STANDARDS 810 C, D, E, & F

	MIL-STD 810C		MIL-STD 810D		MIL-STD 810E		MIL-STD 810F	
	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
High Temperature Storage	501.1	I	501.2	I/A1	501.3	I/A1	501.4	I/Hot
High Temperature Operational	501.1	II	501.2	II/A1	501.3	II/A1	501.4	I/Hot
Low Temperature Storage	502.1	I	502.2	I/C3	502.3	I/C3	502.4	I/C3
Low Temperature Operational	502.1	I	502.2	II/C1	502.3	II/C1	502.4	II/C1
Temperature Shock	503.1	-	503.2	I/A1-C3	503.3	I/A1-C3	503.4	I/Hot-C3
Solar Radiation	505.1	II	505.2	I	505.3	I	505.4	I
Rain Blowing	506.1	I	506.2	I	506.3	I	506.4	I
Rain Steady	506.1	II	506.2	II	506.3	II	506.4	III
Humidity	507.1	II	507.2	II	507.3	II	507.4	-
Salt Fog	509.1	-	509.2	-	509.3	-	509.4	-
Blowing Dust	510.1	I	510.2	I	510.3	I	510.4	I
Blowing Sand			510.2	II	510.3	II	510.4	II
Vibration Minimum Integrity	514.2	VIII/F, Curve-W	514.3	I/10	514.4	I/10	514.5	I/24
Vibration Loose Cargo			514.3	II/3	514.4	II/3	514.5	II/5
Shock Functional	516.2	I	516.3	I	516.4	I	516.5	I
Shock Crash Hazard	516.2	III	516.3	V	516.4	V	516.5	V
Shock Bench Handling	516.2	V	516.3	VI	516.4	VI	516.5	VI

MOTOROLA

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