

# ASTRO<sup>®</sup> XTL<sup>™</sup> 2500

## 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)
- 25-110 Watt (136-174 MHz)
- 25-110 Watt (380-470 MHz)

870 Channels (Standard)

Dual mode operation (ASTRO Digital and Analog)

9600 and 3600 Baud capable

Project 25 capability on Conventional and Trunking systems

Type II Trunking Only

Project 25 compliance interoperable voice signaling features

Integrated voice and data capable

#### 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)

5 Programmable buttons x 4 deep in menu functions

14 digit character display

Tri-color Backlit LCD display

Emergency button

Multi level display dim button

Dash/Remote mount

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



Utilizes Windows<sup>®</sup>-based customer software programming

Built in FLASHport<sup>™</sup> support

Optional Keypad microphone

External Speaker

USB/RS232 connectivity

Optional Siren PA

Optional DEK

Upgradable

Encryption Capable:

- Type III (optional)
- Allows for MultiKey for single algorithms ONLY
- Algorithms supported:
  - DVI-XL
  - DVP-XL
  - DES
  - DES-XL
  - DES-OFB
  - AES
  - Advanced Digital Privacy (ADP)

Dual Control Head

OTAP (Over-the-air programming)

Tactical OTAR (Over-the-air re-keying)

Text Messaging

Motorola's XTL 2500 Project 25 compliant mobile radio is tough and well suited for users in Police, Fire, EMS, State/Local/Federal Government agencies. 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 2500 digital mobile radio supports APCO Project 25 and is available in 136-174 MHz,

380-470MHz, 450-520 MHz 764-870 MHz frequency bands and supports the accessories common to the XTL 5000 mobile radio.

The XTL 2500 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 2500 digital mobile radio is the radio of choice.

## SPECIFICATION SHEET

ASTRO® XTL™ 2500  
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 kbps 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 (0.68 kg)

### MOBILE

Dimensions	<b>Mid Power Radio Transceiver</b> 2" x 7" x 7.8" (50.8 x 177.8 x 198.1 mm) <b>Control Head</b> 2.35" x 7.1" x 2.5" (59.7 x 180.3 x 63.5 mm) <b>Mid Power Radio Transceiver and Control Head– Dash Mount</b> 2.35" x 7.1" x 9.1" (59.7 x 180.3 x 231.1 mm) <b>High Power Transceiver</b> 2.765" x 8.08" x 12.31" (70.2 x 205.2 x 312.7 mm)
Weight	<b>Mid Power Radio Transceiver and Control Head</b> 6.1 lbs (2.77 kg) (764-870 MHz and 136-174 MHz) 6.1 lbs (2.77 kg) (380-470 MHz and 450-520 MHz) <b>High Power Radio Transceiver with Handle</b> 8.8 lbs (3.99 kg) (136-174 MHz and 380-470 MHz)

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ASTRO® XTL™ 2500  
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### 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 or 25-110W
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 12.5 kHz channel	±5 kHz, +/-4 kHz (NPSPAC) ±2.5 kHz	±5 kHz ±2.5 kHz	±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 12.5 kHz	40 dB 34 dB	45 dB 40 dB	45 dB 40 dB
Emissions (GNSS=Global Navigation Satellite System)	Conducted -85 dBc (GNSS)	Radiated -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 136-174 MHz (25-110 Watt) 0.85A 380-470 MHz (25-110 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 136-174 MHz (25-110 Watt) 3.2A 380-470 MHz (25-110 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) 136-174 MHz (25-110 Watt) 20A (100W) 380-470 MHz (25-110 Watt) 24A (100W)

### 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
136-174 MHz	25-110 W	AZ492FT3808
380-470 MHz	25-110 W	AZ492FT4870

### ENVIRONMENTAL SPECIFICATIONS

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

## SPECIFICATION SHEET

ASTRO® XTL™ 2500  
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### 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		
Analog Sensitivity		<b>Pre-amp</b>	<b>Standard</b>	<b>Pre-Amp</b>	<b>Standard</b>
20 dB Quieting	.30 $\mu$ V	0.25 $\mu$ V	0.40 $\mu$ V	0.25 $\mu$ V	0.40 $\mu$ V
12 dB SINAD per EIA	.25 $\mu$ V	0.20 $\mu$ V	0.30 $\mu$ V	0.20 $\mu$ V	0.30 $\mu$ V
Digital Sensitivity					
1% BER (12.5 kHz channel)	.30 $\mu$ V	0.25 $\mu$ V	0.40 $\mu$ V	0.25 $\mu$ V	0.40 $\mu$ V
5% BER (12.5 kHz channel)	.25 $\mu$ V	0.20 $\mu$ V	0.30 $\mu$ V	0.20 $\mu$ V	0.30 $\mu$ V
Intermodulation Distortion	80 dB	80 dB	85 dB	80 dB	85 dB
Spurious Response Rejection	90 dB	90 dB	90 dB	90 dB	90 dB
Audio Output Power at 3% distortion (External/Internal Speaker)	7.5 W (8 $\Omega$ ext. speaker) 13 W (3.2 $\Omega$ ext. speaker)	7.5 W (8 $\Omega$ ext. speaker) 13 W (3.2 $\Omega$ ext. speaker)	7.5 W (8 $\Omega$ ext. speaker) 13 W (3.2 $\Omega$ ext. 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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R3-1-2028D