

Specification Sheet

ASTRO XTS 3000 Digital Portable Radio



MOTOROLA
intelligence everywhere™

All models are available in a Ruggedized version, with either a Black or "Public Safety Yellow" housing.

FEATURES

- Multiple modes of operation in a single radio (ASTRO digital clear and encrypted, Analog, and SECURENET encrypted operation)
- Project 25 capable on Conventional systems
- Project 25 compliant interoperable voice signalling features
- Project 25 data capable on Conventional systems
- Narrow and wide bandwidth digital receiver (12.5, 25/30 kHz)
- High quality, error corrected digital voice
- High speed and embedded digital signalling (ASTRO)
- VHF, UHF and 800 MHz Bands
- FLASHport capable
- Enhanced encryption capability (optional):
16 Encryption keys
2 Encryption algorithms
- Meets Mil Specs 810 C, D, E
- Programmable switches/buttons
- ASTRO Ready – analog only operation (optional)
- Adaptive power control extends battery life



MODEL I:

- Large PTT button
- Angled On/Off volume knob
- Orange Emergency button
- Illuminated 16 position, top mounted rotary knob
- 2 position concentric switch
- 3 position toggle switch
- Programmable Monitor button
- 2 programmable side buttons
- Transmit LED Indicator
- Non-keypad/Non-display
- Up to 48 Channels

MODEL II:

Same as XTS 3000 Model I features plus the following:

- 255 Channels
- Dial from prestored lists
- Programmable softkeys for easy access to radio functions
- Backlit keypad
 - 2 x 3 navigational keys
- Large Display
 - 4 lines and 12 characters
 - Status icons including battery and power indicator

MODEL III:

Same as XTS 3000 Model I features plus the following:

- 255 Channels
- Dial from prestored lists
- Programmable softkeys for easy access to radio functions
- Backlit keypad
 - 3 soft keys
 - 2 x 3 navigational keys
 - 4 x 3 DTMF
- Large Display
 - 4 lines and 12 characters
 - Status icons including battery and power indicator
- Unlimited dialing from keypad

GENERAL PERFORMANCE SPECIFICATIONS

Modulation	C4FM of QPSK-C family (Compatible Quadrature Phase Shift Keying)
Protocol	
ASTRO	4.8 kbps VSELP, 2.1 kbps Error Correction Coding, 2.7 kbps Embedded Signaling
Project 25-CAI	4.4 kbps IMBE, 2.8 kbps Error Correction Coding, 2.4 kbps Embedded Signaling
SECURENET	12 kbps CVSD
Channel Bandwidth	
ASTRO VSELP & Project 25-CAI and Analog	12.5 kHz
SECURENET & Analog	20/25/30 kHz

VOICE CODER (ASTRO MODE)

Voice Coding Method	
VSELP	Vector Sum Excited Linear Predictive Coding
IMBE (CAI)	Improved Multi Band Excitation
CVSD	Continuously Variable Slope Delta Modulation (for SECURENET mode)
Voice Truncation	None (250 msec for SECURENET mode)
Frame Re-sync Interval	180 msec (clear digital mode)
Forward Error Correction	Golay code
Error Mitigation	(VSELP): Dual Level Level 1: Extrapolates and replaces 30 msec voice frames that exceed the error correction algorithm tolerance Level 2: Progressive muting of 30 msec voice frames that are too severely damaged for Level 1 replacement
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	ASTRO VSELP: Linear sum of basic vectors Project 25 (IMBE): No Code Book

SIGNALLING (ASTRO MODE)

Signalling Rate	9.6 kbps
Digital ID Capacity	16,700,000 IDs
Digital Network Access Codes	4,096 network site addresses
Digital User Group Addresses	4,096
Energy Management	Automatic 3dB RF cutback based on infrastructure RSSI signalling
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.

SUBMERSION SPECIFICATIONS (RUGGEDIZED MODELS ONLY)

Leakage (immersion)	MIL-STD-810C Method 512.1 Procedure I
Leakage (immersion)	MIL-STD-810D Method 512.2 Procedure I
Leakage (immersion)	MIL-STD-810E Method 512.3 Procedure I

TRANSMITTER

TYPICAL PERFORMANCE SPECIFICATIONS

	VHF	UHF	800 MHz
Frequency Range/Bandsplits	136-174 MHz	403-470 MHz (Range 1) 450-520 MHz (Range 2)	806-824 MHz
Channel Spacing	12.5/20/25/30 kHz	12.5/20/25 kHz	12.5/20/25 kHz
Maximum Frequency Separation	Full Bandsplit	Full Bandsplit	Full Bandsplit
Rated RF Output Power, Adj.†	1 to 5W	1 to 4W	3W
Frequency Stability†*** (-30°C to +60°C +25°C Ref.)	±0.00020%	±0.00020%	±0.00015%
Modulation Limiting			
25/30 kHz chnls	±5.0 kHz	±5.0 kHz	±5.0 kHz
20 kHz chnls	±4.0 kHz	±4.0 kHz	N/A
12.5 kHz (NPSPAC) chnls	N/A	N/A	±4.0 kHz
12.5 kHz chnls	±2.5 kHz	±2.5 kHz	±2.5 kHz
FM Hum & Noise†			
25/30 kHz	-48 dB	-45 dB	-45 dB
12.5 kHz	-42 dB	-42 dB	-39 dB
Emissions†*** (Conducted & Radiated)	-70 dBC	-70 dBC	-70 dBC
Audio Response† (6dB/Octave Pre-emphasis from 300 to 3000 Hz)	+1, -3 dB (EIA)	+1, -3 dB (EIA)	+1, -3 dB (EIA)
Audio Distortion per EIA†	<2%	<2%	<2%

RECEIVER

TYPICAL PERFORMANCE SPECIFICATIONS

	VHF	UHF	800 MHz
Frequency Range/Bandsplits	136-174 MHz	403-470 MHz (Range 1) 450-520 MHz (Range 2)	851-870 MHz
Channel Spacing	12.5/20/25/30 kHz	12.5/20/25 kHz	12.5/20/25 kHz
Maximum Frequency Separation	Full Bandsplit	Full Bandsplit	Full Bandsplit
Analog Sensitivity			
20 dB Quietening (25/30 kHz chnl)†	0.35µV	0.35µV	0.40µV
12 dB SINAD per EIA (25/30 kHz chnl)†	0.25µV	0.25µV	0.25µV
Digital Sensitivity***			
1% BER (12.5 kHz chnl)	0.40µV	0.40µV	0.40µV
5% BER (12.5 kHz chnl)**	0.25µV	0.25µV	0.25µV
Selectivity† (25/30 kHz chnl)† per EIA (12.5 kHz chnl)	-78 dB -67 dB	-78 dB -68 dB	-75 dB -63 dB
Intermodulation†*** (25/30 kHz chnl)	-78 dB	-77 dB	-74 dB
Spurious Response†***	-75 dBC	-75 dBC	-75 dBC
Frequency Stability	±0.00020%	±0.00020%	±0.00015%
Audio Distortion	<2%	<2%	<2%
Audio Output per EIA (@≤3% Electrical Distortion)†***	500 mW	500 mW	500 mW

† Measured in the analog mode per TIA/EIA 603

** Recovered digital audio quality @ 5% Bit Error Rate is approximately equal to audio quality @ 12 dB SINAD for kHz channel

*** Measured in digital mode per TIA/EIA TSB 102.CAAB

RADIO MODELS

					VHF BAND	UHF Band	800 MHz Band
Bandsplit					136-174 MHz 450-520 MHz Range 2)	403 470 MHz (Range 1)	806-870 MHz
Model	Display	Keypad	Channel Capability	FLASHport Memory	Model Numbers	Model Numbers	Model Numbers
Model I	None	None	16/48	1 MB	H09KDC9PW5_N	H09RDC9PW5_N (Range 1) H09SDC9PW5_N (Range 2)	H09UCC9PW5_N
Model II	4 Lines/ 12-Characters per line Liquid Crystal Display	3 x 2	255	1 MB	H09KDF9PW7_N	H09RDF9PW7_N (Range 1) H09SDF9PW7_N (Range 2)	H09UCF9PW7_N
Model III	4 Lines/ 12-Characters per line Liquid Crystal Display	3 x 6 Button	255	1 MB	H09KDH9PW7_N	H09RDH9PW7_N (Range 1) H09SDH9PW7_N (Range 2)	H09UCH9PW7_N
FCC Designations					AZ489FT3790	AZ489FT4782 (Range 1) AZ489FT4783 (Range 2)	AZ489FT5774
Power Supply		One rechargeable nickel-cadmium battery or one rechargeable nickel-metal hydride battery					
Dimensions without battery (H x W x D)		6.58" x 2.44" x 1.65" (167.13 x 61.90 x 41.97 mm)					
Weight with Ultra High Capacity NiCd		390 g 704 g					
FCC Emissions Designators		8K10F1E, 20K0F1E, 16K0F3E, 8K10F1D, 11K0F3E, 11K0F2D, 11K0F1D, 15K0F1D, 15K0F2D, 20K0F1D, 10K4F3E					

ENCRYPTION

Encryption Algorithm Capacity	2 algorithms per radio		
Encryption Keys per Radio	16 keys (ASTRO and SECURENET compatible)		
Encryption Frame Re-sync Interval	ASTRO:	360 msec	
	SECURENET:	500 msec	
	Project 25-CAI	360 msec	
Encryption Keying	Over-the-air Rekeying and Key Loader		
Synchronization	Counter Addressing, Cipher Feedback, and Output Feedback		
Code Key Generator	External hand held microprocessor controlled key variable loader		
Encryption Key Tag Capacity per System	65,000		
Encryption Type	Digital		
Number of Unique Keys	Dependent on encryption algorithm		
Code Key Initialization	Internally derived pseudo-random initializing vector		
Key Storage	Volatile electronic memory or non-volatile electronic memory		
Key Erasure	Keyboard command, tamper detection, and over-the-air command		

MEETS OR EXCEEDS MILITARY STANDARDS 810E, 810D & 810C MECHANICAL SPECIFICATIONS WHERE APPLICABLE

Standard	U.S. Military Spec 810E Method/Procedure	U.S. Military Spec 810D Method/Procedure	U.S. Military Spec 810C Method/Procedure
Low Pressure	500.3/I	500.2/I	500.1/I
High Temperature (Storage)	501.3/I	501.2/I Category A1 (Induced)	501.1/I
High Temperature (Operational)	501.3/II	501.2/II Category A1 (Induced)	501.1/II
Low Temperature	502.3/I	502.2/I Category C1 (Induced)	502.1/I
Temperature Shock	503.3/I	503.2/I	503.1/I
Solar Radiation	505.3/I	505.2/I Figure 505.2	505.1/I
Rain & Blowing Rain	506.3/I&II	506.2/I&II	506.1/I&II
Humidity	507.3/II (Cycle-5)	507.2/II (Cycle-5)	507.1/II
Salt Fog	509.3/I	509.2/I	509.1/I
Dust	510.3/I	510.2/I	510.1/I
Vibration	514.4/I (Category 10)	514.3/I (Category 10)	514.2/III (Curve W)
Shock	516.4/I, IV & VI	516.3/I, IV & VI	516.2/I, II & V

BATTERIES FOR ASTRO DIGITAL XTS 3000

Battery Capacity/Type	Dimensions (HxWxD)	Battery Part Numbers	Duty Cycle
Ultra-High Capacity Nickel-Cadmium	6.15" x 2.3" x .92"	NTN8294	5-5-90 8 hr.
Ultra-High Capacity NiMH	6.15" x 2.3" x .92"	NTN8298	5-5-90 8 hr.
High Capacity Lithium Ion	6.15" x 2.3" x .60"	NTN8610	5-5-90 8 hr.
Ultra-High Capacity NiCD Ruggedized	6.15" x 2.3" x .92"	NTN8297	5-5-90 8 hr.
Extended Life NiMH	6.15" x 2.3" x .92"	NTN8923	5-5-90 9 hr.



Motorola's Commercial, Government and Industrial Solutions Sector is a recipient of the prestigious 2002 Malcolm Baldrige National Quality Award. This honor demonstrates our commitment to performance excellence and quality achievement.



MOTOROLA, XTS 3000, FLASHport and the Stylized M Logo are registered in the U.S. Patent and Trademark Office. All other product or service names are the property of their respective owners.
©Motorola, Inc. 2003. (0305) VPS

Specifications subject to change without notice.