# **ASTRO XTS 3000**<sup>™</sup>

**Digital Portable Radio** 



#### **FEATURES**

- ► High speed and embedded digital signalling (ASTRO)
  - ► VHF, UHF and 800 MHz Bands
  - ► **FLASHport**<sup>™</sup> 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)

Model III

► Adaptive power control extends battery life

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



► Multiple modes of operation in a single radio

and SECURENET encrypted operation)

▶ Project 25 compliant interoperable voice

► Narrow and wide bandwidth digital receiver

► High quality, error corrected digital voice

signalling features

(12.5, 25/30 kHz)

(ASTRO digital clear and encrypted, Analog,

▶ Project 25 capable on Conventional systems

▶ Project 25 data capable on Conventional systems

#### 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
- 4 x 3 DTMF
- ► Large Display
  - Status icons including battery
  - ► Unlimited dialing from keypad

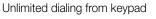


GENERAL	PERFORMAN	CE SPECIFICATIONS		
Modulation:	C4FM of QPSK-C family (Compatible Quadrature Phase Shift Keying)			
Protocol:	ASTRO:	4.8 kbps VSELP,2.1 kbps Error Correction Coding, 2.7 kbps Embedded Signaling		
	Project 25-CAI	4.4 kbps IMBE, 2.8 kbps Error Correction Coding, 2.4 kbps Embedded Signalling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

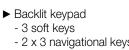
VC	DICE CODER (ASTRO MODE)
Voice Coding Method:	VSELP: Vector Sum Excited Linear Predictive Coding IMBE (CAI): Improved Multi Band Excitation CVSD: Continuously Variable Slope Delta Modulation (for SECURENET mode)
Voice Truncation:	None (250 msec for SECURENET mode)
Frame Re-sync Interval:	180 msec (clear 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.	

- plus the
- ▶ 255 0
- ► Programmable softkeys for easy access to radio functions
- 4 lines and 12 characters
- and power indicator

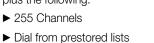


- 3 soft keys - 2 x 3 navigational keys





Same as XTS 3000 Model I featur plus the following:
► 255 Channels
<ul> <li>Dial from prestored lists</li> </ul>
Programmable softkovs for one



	TRANSMIT	TER		
TYPICAL PERFORMANCE SPECIFICATIONS				
	VHF	UHF	800 MHz	
Frequency Range/ Bandsplits:	136-174 MHz	403-470 MHz (Range 1)	806-824 MHz	
		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	
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 20 kHz chnls 12.5 kHz	±5.0 kHz ±4.0 kHz	±5.0 kHz ±4.0 kHz	±5.0 kHz N/A	
(NPSPAC) chnis 12.5 kHz chnis	N/A ±2.5 kHz	N/A ±2.5 kHz	±4.0 kHz ±2.5 kHz	
FM Hum & Noise†: 25/30 kHz 12.5 kHz	-48 dB -42 dB	45 dB 42 dB	–45 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				
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 Quieting (25/30 kHz chnl)†:	0.35 <i>µ</i> V	0.35 <i>µ</i> N	0.40 <i>µ</i> N	
12`dB SINAD per ÉlÀ (25/30 kHz chnl)†: Digital Sensitivity***:	0.25 <i>µ</i> N	0.25 <i>µ</i> N	0.25µN	
1% BER (12.5 kHz chnl): 5% BER (12.5 kHz chnl)**:	0.40µN 0.25µN	0.40µN 0.25µN	0.40µN 0.25µN	
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	

SUBMERSION SPEC	CIFICATIONS (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		
Testing to be performed at 6 feet for four hours where MIL-STD specify 3 feet for two hours		

<sup>†</sup>Measured in the analog mode per TIA/EIA 603 <sup>\*\*</sup>Recovered digital audio quality @ 5% Bit Error Rate is approximately equal to audio quality @ 12 dB SINAD for kHz channel <sup>\*\*\*</sup>Measured in digital mode per TIA/EIA TSB 102.CAAB

## ASTRO XTS 3000

### SPECIFICATIONS

					RADIO MODELS		
					VHF BAND	UHF Band	800 MHz Band
Bandsplit:					136-174 MHz	403 470 MHz (Range 1) 450-520 MHz Range 2)	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 Designa	tions:			AZ489FT3790	AZ489FT4782 (Range 1) AZ489FT4783 (Range 2)	AZ489FT5774
	Power S	upply: One r	echargeable nickel	-cadmium battery (	or one rechargeable nickel-metal	l hydride battery	•
wit	Dimen hout battery (H x V		x 2.44″ x 1.65″ (16	67.13 x 61.90 x 41	.97 mm)		
with Ul	Weight:         390 g           Ultra High Capacity NiCd:         704 g						
500.	Emissions Design	ators: 8K10	-1E. 20K0F1E. 16	K0F3E, 8K10F1D,1	1K0F3E, 11K0F2D, 11K0F1D, 1	5K0FID, 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		

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.	

Support Services Wherever Motorola sells, our product is backed by

service. Our products are serviced throughout the world by a wide network of company or authorized

independent distributor service organizations.

CUSTOMER

SERVICE

#### $(\mathbf{A})$ MOTOROLA

Motorola U.S.A. Motorola Canada Limited 1301 E. Algonquin Road3000 Victoria Park AvenueSchaumburg, Illinois 60196North York, Ontario M2H 3H7In the U.S. call: 1-888-567-7347In Canada call: 1-800-268-5758 Outside the U.S. and Canada call: (847) 538-6602  $\circledast$  , Motorola, XTS 3000 and FLASHport are trademarks of Motorola, Inc.

■ ©1999 by Motorola, Inc. ■ Printed in U.S.A. ■ (9908) Merit Produced by Customer Communications.

Motorola is an Equal Employment Opportunity/Affirmative Action Employer

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/II	500.2/I	500.1/l	
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/l	
Temperature Shock	503.3/I	503.2/I	503.1/l	
Solar Radiation	505.3/I	505.2/I Figure 505.2	505.1/l	
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	509.2/1	509.1/l	
Dust	510.3/I	510.2/I	510.1/l	
Vibration	514.4/l (Category 10)	514.3/I(Category 10)	514.2/VIII (Curve W)	
Shock	516.4/I, IV & VI	516.3/I, IV & VI	516.2/l, ll & V	

Specifications subject to change without notice.