

ASTRO XTS 3000™

Digital Portable Radio

ASTRO
DIGITAL SOLUTIONS

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

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



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.

 **MOTOROLA**

ASTRO XTS 3000

SPECIFICATIONS

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 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 chnl 20 kHz chnl 12.5 kHz (NPSAC) chnl 12.5 kHz chnl	±5.0 kHz ±4.0 kHz N/A ±2.5 kHz	±5.0 kHz ±4.0 kHz N/A ±2.5 kHz	±5.0 kHz N/A ±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			
	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 Quieting (25/30 kHz chnl)†: 12 dB SINAD per EIA (25/30 kHz chnl)†: Digital Sensitivity***: 1% BER (12.5 kHz chnl): 5% BER (12.5 kHz chnl)**:	0.35µV 0.25µV 0.40µV 0.25µV	0.35µV 0.25µV 0.40µV 0.25µV	0.40µV 0.25µV 0.40µV 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

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

†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	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 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: 390 g with Ultra High Capacity NiCd: 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		

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.

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/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

Specifications subject to change without notice.



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