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

Model II

Model III

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

MOTOROLA

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 Signalling
	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.

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 chnls** **20 kHz chnls** **12.5 kHz (NPSPAC) chnls** **12.5 kHz chnls**	 ±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: **with Ultra High Capacity NiCd:**	390 g 704 g						
FCC Emissions Designators:	8K10F1E, 20K0F1E, 16K0F3E, 8K10F1D,11K0F3E, 11K0F2D, 11K0F1D, 15K0FID, 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.

CUSTOMER MOTOROLA Communications SERVICE

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/VIII (Curve W)
Shock	516.4/I, IV & VI	516.3/I, IV & VI	516.2/I, II & V

Specifications subject to change without notice.

MOTOROLA

Motorola U.S.A.
1301 E. Algonquin Road
Schaumburg, Illinois 60196
In the U.S. call: 1-888-567-7347

Motorola Canada Limited
3900 Victoria Park Avenue
North York, Ontario M2H 3H7
In Canada call: 1-800-268-5758

Outside the U.S. and Canada call: (847) 538-6602