

## MODEL FEATURES

## Frequency Bands

- 136-174 MHz
- 380-470MHz
- 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)

## 512 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 or RS232 capable

## Bandwidth Receiver

- 12.5/30 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 x4 deep in menu functions

## 14 digit character display

## Multiple Color Backlit LCD display

## Emergency button

## Multi level DIM button

## Dash/Remote mount

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

Utilizes Windows®-based customer programming

Built in FLASHport™ support

Optional Keypad microphone

External Speaker

USB/RS232 connectivity

Optional Siren PA

Optional DEK

Upgradeable

## 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)

Reuse of most ASTRO/MCS accessories

# ASTRO® XTL™ 5000

## Digital Mobile Radio



Motorola's XTL 5000 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 5000 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 platform.

The XTL 5000 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 5000 digital mobile radio is the radio of choice.

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**GENERAL PERFORMANCE SPECIFICATIONS**

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|                   |   |
|-------------------|---|
| Frequency range   | 136-174 MHz<br>380-470MHz<br>450-520 MHz<br>764-870 MHz   |
| Modulation        | C4FM of QPSK-C family<br>(Compatible Quadrature Phase Shift Keying)                                     |
| Protocol          |   |
| Project 25-CAI    | 4.4 kbps IMBE, 2.8 kbs Error Correction Coding, 2.4 kbps<br>Embedded Signaling                          |
| Channel Bandwidth |   |
| Analog            | 12.5/30 kHz (136-174 MHz)<br>12.5/25 kHz (380-470 MHz and 450-520 MHz);<br>12.5/20/25 kHz (764-870 MHz) |
| Digital           | 12.5 kHz  |

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**VOICE CODER**

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|  |   |
|--|---|
| Voice Coding Method IMBE (CAI)         | Improved Multi Band Excitation  |
| 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<br>the error correction algorithm tolerance.<br><br>Level 2: Progressive muting of 20 mSec voice frames that are too<br>severely damaged for Level 1 replacement. |
| Code Book Structure                    | APCO Project 25 (IMBE): No code book  |

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**SIGNALLING (ASTRO MODE)**

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|                                    |  |
|------------------------------------|--|
| 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<br>both voice and data transmissions. |

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**SPEAKER**

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|            |   |
|------------|---|
| Dimensions | 5.5" x 5.5" x 2.5"<br>(139.7 x 139.7 x 63.5 mm)<br>(Excluding mounting bracket) |
| Weight     | 1.5 lbs (0.68 kg)   |

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**MOBILE**

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|            |  |
|------------|--|
| Dimensions | Mid Power Radio Transceiver<br>2" x 7" x 7.8" (50.8 x 177.8 x 198.1 mm)<br><br>Control Head<br>2.0" x 7.1" x 2.5" (50.8 x 180.3 x 63.5 mm)<br><br>Mid Power Radio Transceiver and Control Head – Dash Mount<br>2.0" x 7.1" x 9.1" (50.8 x 180.3 x 231.1 mm)<br><br>High Power Transceiver<br>2.765" x 8.08" x 12.31" (70.2 x 205.2 x 312.7 mm) |
| Weight     | Mid Power Radio Transceiver and Control Head<br>6.1 lbs (2.77 kg) (764-870 MHz and 136-174 MHz)<br>6.1 lbs (2.77 kg) (380-470 MHz and 450-520 MHz)<br><br>High Power Radio Transceiver with Handle<br>8.8 lbs (3.99 kg) (136-174 MHz and 380-470 MHz)  |

**TRANSMITTER**

|   |  |   |   |
|---|--|---|---|
| Frequency   | 764-776 MHz<br>794-806 MHz<br>806-825 MHz<br>851-870 MHz | 380-470 MHz<br>and<br>136-174 MHz         | 136-174 MHz                               |
| RF Power  | 10-35W   | 25-110W                                   | 25-110W                                   |
| Max Freq Separation   | Full Bandsplit   | Ref Above Bandsplit                       | Full Bandsplit                            |
| Freq Stability Operating Freq Accuracy<br>(-30C to +60C;+25C Ref) – 700/800 & UHF<br>(+/- 2ppm (-30C to +60C) - VHF |  |   |   |
|   | 1.5 ppm  | 2 ppm                                     | 2.5 ppm                                   |
| Modulation Limiting   |  |   |   |
| 25/20 kHz, 25 kHz, 25/30 kHz channel  | ±5 kHz, +/-4 kHz (NPSAQC)                                | ±5 kHz                                    | ±5 kHz                                    |
| 12.5 kHz channel  | ±2.5 kHz   | ±2.5 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                               | 12.5/30kHz                                |
| FM Hum and Noise  |  |   |   |
| 20/25 kHz, 25 kHz, 20/25 kHz  | 40 dB  | 45 dB                                     | 50 dB                                     |
| 12.5 kHz  | 34 dB  | 40 dB                                     | 40 dB                                     |
| Emissions   |  |   |   |
|   | Conducted   Radiated<br>-70 dBc   -85 dBc                | Conducted   Radiated<br>-85 dBc   -20 dBc | Conducted   Radiated<br>-85 dBc   -85 dBc |
| Audio Response<br>(6db/Octave Pre-emphasis<br>from 300 to 3000 Hz)  |  |   |   |
|   | +1, -3 dB (EIA)  | +1, -3 dB (EIA)                           | +1, -3 dB (EIA)                           |
| Audio Distortion per EIA  | 2%   | 2%  | 2%  |

**POWER AND BATTERY DRAIN**

|                                |  |
|--------------------------------|--|
| Model Type                     | 136-174 MHz<br>380-470MHz<br>450-520 MHz<br>764-870 MHz  |
| Minimum RF Power Output        | 10-50 Watt (136-174 MHz)<br>10-40 Watt (380-470 MHz)<br>10-45 Watt (450-520 MHz)<br>10-35 Watt (764-870 MHz)<br>25-110 Watt (136-174 MHz)<br>25-110 Watt (380-470 MHz) |
| Operation                      | 12V DC Negative Ground   |
| Standby at 13.8V               |  |
| 136-174 MHz                    | 0.5A-0.7A  |
| 380-470 MHz and 450-520 MHz    | 0.65A-0.85A  |
| 764-870 MHz                    | 0.7A   |
| Receive at Rate Audio at 13.8V |  |
| 136-174 MHz                    | 1.3A-3.0A  |
| 380-470 MHz and 450-520 MHz    | 1.5A-3.2A  |
| 764-870 MHz                    | 3.0A   |
| Transmit at Rated Power        |  |
| 136-174 MHz                    | 7A-10A   |
| 380-470 MHz                    | 5.7A-13.7A   |
| 450-520 MHz                    | 13A (45W)  |
| 764-870 MHz                    | 8A (15W), 13A (35W)  |

**FCC TYPE ACCEPTANCE ID**

| Band        | Transmitter Power |             |
|-------------|-------------------|-------------|
|             | Output            | 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  |
| International Protection | IP54 certified |

## RECEIVER

| Frequency   | 700/800 MHz          | UHF                  | VHF                  |              |              |
|---|----------------------|----------------------|----------------------|--------------|--------------|
| Channel Spacing   | 12.5 / 20 / 25 kHz   | 12.5 / 25 kHz        | 12.5 / 30 kHz        |              |              |
| Maximum Frequency Separation                                | Full Bandsplit       | Full Bandsplit       | Full Bandsplit       |              |              |
| Analog Sensitivity  |                      |                      |                      |              |              |
| 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   | 80 dB                | 80 dB                | 85 dB                | 85 dB        | 85 dB        |
| Spurious Response Rejection                                 | 80 dB                | 90 dB                | 90 dB                | 90 dB        | 90 dB        |
| Audio Output Power at 3% distortion                         | 7.5 W (ext. speaker) | 7.5 W (ext. speaker) | 7.5 W (ext. speaker) |              |              |
| (External/Internal Speaker)                                 | 3 W (int. speaker)   | 3 W (int. speaker)   | 3 W (int. speaker)   |              |              |
| Adjacent Channel Rejection Selectivity<br>(12.5 kHz/25 kHz) | 65 dB   80 dB        | 75 dB                | 82 dB                | 85 dB        | 85 dB        |
|   |                      |                      |                      | 70 dB        | 70 dB        |

## 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 Storage    | 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         |



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