Specification Sheet

ASTRO™ DIGITAL PLUS CONSOLETTE

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ASTRO DIGITAL PLUS CONSOLETTE MODELS SHOWN ARE W7 (TOP) AND W9 (BOTTOM)

MODEL FEATURES

LOCAL CONTROL (W7)

- Up to 512 Modes
- Full Keypad
- 8 Character/One Line Alphanumeric Display
- Includes Desk Mic and Internal 5 Watt Speaker
- Lightweight (16.3 lbs/7.4 kg)

W7 OPTIONS

- G114: Digital ID Display via Front Panel and Gold Series Elite Console (requires L146)
- L146: Includes Tone Remote Control and ACIM connection to Gold Series Elite console

DIGITAL REMOTE CONTROL (W9)

- Up to 512 Modes
- Requires Digital Remote Deskset (See R3-13-2006 for MC3000 Digital Desktop Controller)
- Allows Multiple Remote Desksets to be Connected
- Lightweight (15.3 lbs/6.9 kg)

W9 OPTIONS

- G114: Digital ID Display via Digital Remote Deskset

FEATURES

- Full 9600 Baud Features
- Supports Remote Control operation using:
  – Digital Deskset(s) (W9 models)
  – Tone Deskset/Console (W7 models with L146)
  – Gold Elite Console (via ACIM) (W7 models with L146)
- Multiple modes of operation in a single radio (ASTRO digital clear and encrypted, and Analog)
- Project 25 capable on Trunking systems
- Project 25 compliant interoperable voice signalling features
- FLASHport™ capable
- Narrow and wide bandwidth digital receiver (12.5, 20/25/30 kHz)
- Enhanced encryption capability (optional)
  48 Encryption keys
  5 Encryption algorithms
- High quality, error corrected digital voice
- Supports embedded digital signalling (ASTRO)
- Programmable buttons (W7 models)
- 20% Duty cycle (all bands & powers)
- Integrated 110/220 Volt power supply
- Mounting bracket EIA 19" available

MODEL TYPE	LOCAL CONTROL (W7)	DIGITAL REMOTE CONTROL (W9)
Hardware Configuration	Front Panel Operation with 3 x 4 Keypad for Direct Dialing, Electronic Mode/Volume Control	No Control Head on Station, Requires Digital Remote Deskset
Bands Supported	VHF R1 (136-162 MHz) VHF R2 (146-174 MHz) UHF R1 (403-433 MHz) UHF R3 (450-482 MHz) 800 MHz (806-869 MHz)	VHF R2 (146-174 MHz) UHF R1 (403-433 MHz) UHF R3 (450-482 MHz) 800 MHz (806-869 MHz)
Display	1 Line/8 Characters - Vacuum Fluorescent Display	See R3-13-2006 for MC3000 Digital Desktop Controller
Channel Capability	512	512
Antenna Connector	Type-N Female	Type-N Female
External Equipment Connectors	DB-25 Connector on Back Panel RJ-45 Connector on Back Panel (requires L146)	DB-25 Connector on Back Panel
Telephone Interconnect Capability	Via Front Panel Keypad	Via Digital Remote Deskset
Included with Basic Package	6 Foot AC Line Cord Desk Mic (Paddle Mic) Internal 5 Watt Speaker	6 Foot AC Line Cord
Optional Features	G806: Digital CAI operation	G806: Digital CAI operation
	G114: Digital ID Display via Front Panel and Gold Series Elite Console (requires L146)	G114: Digital ID Display via Digital Remote Deskset
	L146: Includes Tone Remote Control and digital connection to Gold Series Elite Console	
Dimensions	4.25" x 15.75" x 17" (107.95mm x 400.05mm x 431.8mm)	4.25" x 15.75" x 17" (107.95mm x 400.05mm x 431.8mm)
Weight	16.3 lbs/7.4 kg	15.3 lbs/6.9 kg

L146 OPTION	TONE REMOTE CONTROL	GOLD ELITE CONSOLE CONTROL
Supported Controllers	Tone Desksets, Consoles, etc.	Gold Series Elite Console with 3.0 Conventional
Analog Audio Connections	2 wire/4 wire	2 wire/4 wire
Selectable Modes	Up to 8 modes	Varies with Console options (See R3-13-41C for Gold Series Elite Console)
Encryption Select	Supported	Supported
Monitor	Supported	Supported
ID Display at Remote Location	Not Supported	Supported
ID Types Displayed	N/A	PTT-ID Emergency Call ID Call Alerts
ID Types Not Supported	N/A	Emergency Alarm
ID Signalling Types Supported	N/A	Digital Conventional Digital Trunking (3600 Baud) Digital Trunking (9600 Baud)

GENERAL PERFORMANCE SPECIFICATIONS

Modulation	C4FM of QPSK-C family (Compatible Quadrature Phase Shift Keying)		
Protocol Project 25-CAI	4.4 kbps IMBE, 2.8 kbps Error Correction Coding, 2.4 kbps Embedded Signalling		
Channel Bandwidth	**VHF**	**UHF**	**800 MHz**
Analog	12.5/25/30 kHz	12.5/25 kHz	20/25 kHz
Digital	12.5/25/30 kHz	12.5/25 kHz	12.5/20/25 kHz
Temperature Range	–20° to +50°C		
Humidity	90-95% Relative Humidity @ 50°C		

VOICE CODER

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 & 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	APCO Project-25 (IMBE): No Code Book

SIGNALING (ASTRO MODE)

Signaling Rate	9.6 kbps
Digital ID Capacity	10,000,000 Conventional/64,000 Trunking
Digital Network Access Codes	4,096 Network Site Addresses
ASTRO Digital User Group Addresses	4,096
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 both voice and data transmissions

ENCRYPTION

Encryption Algorithm Capacity	5 algorithms per radio
Encryption Keys per Radio	48 keys (ASTRO compatible)
Encryption Frame Re-sync Interval	Project 25-CAI: 360 mSec
Encryption Keying	Key Variable Loader
Synchronization	Counter Addressing and Cipher Feedback and Output Feedback
Code Key Generator	External hand-held microprocessor controlled key Variable Loader and Key Management Controller
Encryption Key Tag Capacity per System	65,000
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 and tamper detection

FCC TYPE ACCEPTANCE ID

Band	Transmitter Power Output	Number
VHF (136-174)	25-50 Watts	AZ492FT3772
UHF (403-433, 450-482)	20-40 Watts	AZ492FT4786
800 (806-870)	35 Watts	AZ492FT5751**

POWER REQUIREMENTS

AC Requirements	105-132, 187-265 VAC, 47-63 Hz
Power Supply	AC Current Drain (Typical) (110 VAC/220 VAC) duty Cycle EIA 10-10-80

VHF			**UHF**			**800 MHz**		
RF Output	Receive	Transmit	RF Output	Receive	Transmit	RF Output	Receive	Transmit
25-50W Variable	0.7A/0.4A	2.30A/1.16A	25-50W Variable	0.7A/0.4A	2.30A/1.16A	35W**	0.7A/0.4A	1.15A/0.58A

*** 30 Watts Maximum in Talkaround*

The ASTRO Digital Plus CONSOLETTE is FCC approved as a control station under Part 90.213.

TRANSMITTER

	VHF	UHF	800 MHz
Frequency Range/Bandsplits	136-162 MHz (W7 only) 146-174 MHz	403-433 MHz 450-482 MHz	806-824 MHz 851-869 MHz
Channel Spacing	12.5/25/30 kHz	12.5/25 kHz	12.5/20/25 kHz
Maximum Frequency Separation	Full Bandsplit	Full Bandsplit	Full Bandsplit
Frequency Stability† **Operating Frequency Accuracy* (–20°C to +50°C; +25°C Ref.)**	±0.00025%	±0.00020%	±0.00015%
Modulation Limiting†			
25/30 kHz Channels	±5.0 kHz	±5.0 kHz	±5.0 kHz
20 kHz Channels			±4.0 kHz (NPSPAC)
12.5 kHz Channels	±2.5 kHz	±2.5 kHz	
Modulation Fidelity (C4FM)* **12.5 kHz Digital Channels**	±2.8 kHz	±2.8 kHz	±2.8 kHz
FM Hum & Noise†			
20/25 kHz	50 dB	45 dB	40 dB
12.5 kHz	40 dB	40 dB	NA
Emissions (Conducted & Radiated)†*	–70 dBC	–70 dBC	–60 dBC
Audio Response† **(6 dB/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%
Output Impedance	50 ohms		

RECEIVER

	VHF		UHF		800 MHz
Frequency Range/Bandsplits	136-162 MHz (W7 only) 146-174 MHz		403-433 MHz 450-482 MHz		851-869 MHz
Channel Spacing	12.5/25/30 kHz		12.5/25 kHz		12.5/20/25 kHz
Maximum Frequency Separation	Full Bandsplit		Full Bandsplit		Full Bandsplit
Optional Pre-Amp	Yes	No	Yes	No	No
Analog Sensitivity†					
20 dB Quieting (20/25/30 kHz channel)	0.25 µV	0.4 µV	0.25 µV	0.4 µV	0.30 µV
12 dB SINAD per EIA (20/25/30 kHz channel)	0.20 µV	0.3 µV	0.20 µV	0.3 µV	0.25 µV
Digital Sensitivity*					
1% BER (12.5 kHz channel)	0.25 µV	0.4 µV	0.25 µV	0.4 µV	0.30 µV
5% BER (12.5 kHz channel)	0.20 µV	0.3 µV	0.20 µV	0.3 µV	0.25 µV
Adjacent Channel Rejection (Selectivity)†					
(20/25/30 kHz channel)	80 dB	80 dB	80 dB	80 dB	80 dB
(12.5 kHz channel)	70 dB	70 dB	75 dB	75 dB	65 dB
Intermodulation Rejection†* (20/25/30 kHz channel)	80 dB	85 dB	80 dB	85 dB	80 dB
Spurious Response Rejection†*	80 dB	83 dB	80 dB	83 dB	83 dB
Audio Output Distortion†* (@ 3% Electrical Distortion)	5 Watts				
Audio Output at External Speaker (Local Control Only)	5 Watts @ less than 5% Distortion				
Input Impedance	50 ohms				

† *Measured in the analog mode per TIA/EIA 603.*
* *Measured in digital mode per TIA/EIA TSB102.CAAB*
All specifications are typical.

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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.

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Specifications subject to change without notice.

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