



ASTRO[®] 25 G-SERIES SITE EQUIPMENT

DATASHEET | ASTRO 25 G-SERIES SITE EQUIPMENT



MOTOROLA SOLUTIONS



COMMON PLATFORM

The ASTRO® 25 portfolio of RF stations, receivers, site controllers and comparators make up the building blocks for Project 25 (P25) two-way radio communication systems from Motorola Solutions. ASTRO 25 site equipment is built with flexibility, resilience and service in mind.



FLEXIBLE DESIGN. SOFTWARE-CONFIGURABLE.

Because it is defined and configured through software, the common platform has the flexibility to support different modes of operations based on individual site requirements. Simple software downloads provide cyber security patches, new features and technology migrations to carry your needs into the future.



ALWAYS AVAILABLE. RESILIENT TO DISRUPTION.

Built to last, ASTRO 25 sites continue to provide wide-area communication regardless of the conditions. From technology that delivers superior coverage to site designs with no single point of failure (resulting in no more than 1 channel removed from service), ASTRO 25 sites provide best-in-class performance.



SERVICE MADE EASY.

ASTRO 25 sites are built to ease service and maintenance with front access modules, cable connections and LED indicators. Hot-swap modules ensure channels are back on the air with minimal downtime. Remote software upgrades with rolling activation makes it easy to stay up to date with minimal disruption.

TOPOLOGIES

Whether analog, digital, conventional or trunked, ASTRO 25 sites support various modes of operation and can be software-configured based on need.

TRUNKING

ASTRO 25 sites support P25 FDMA and TDMA trunking operations ranging from single site to large regional systems. The sites support seamless interoperability with the ability to dynamically switch between FDMA and TDMA without any user intervention or awareness.

CONVENTIONAL

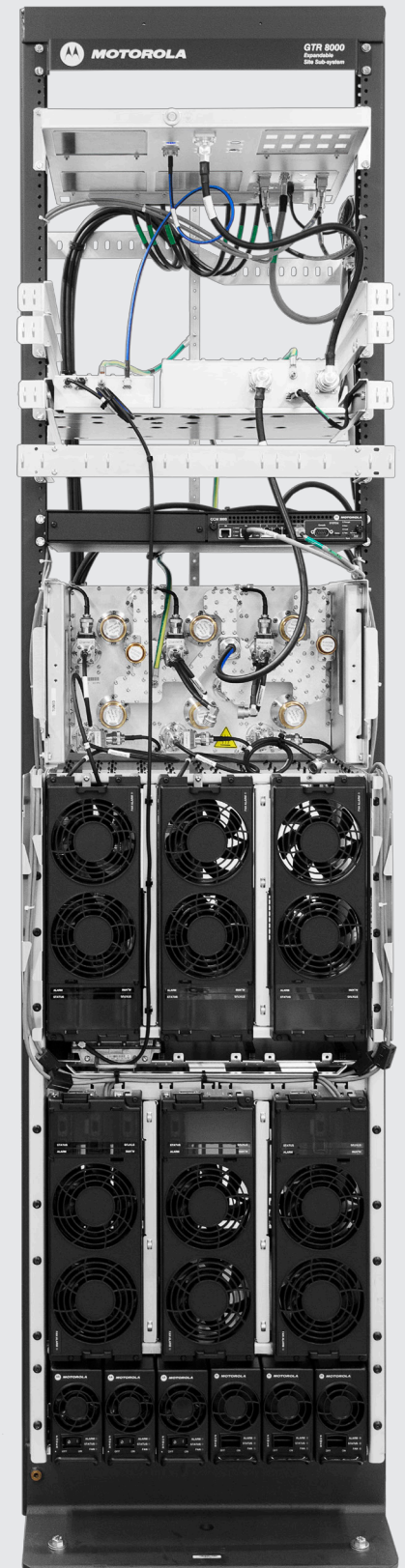
The equipment can be configured to support analog conventional or P25 digital conventional operation. Mixed mode operation supports fleets of both radio types to allow a gradual migration from analog to digital. The ASTRO 25 site components can be used separately for a single conventional repeater or together for a large statewide or country-wide conventional system.

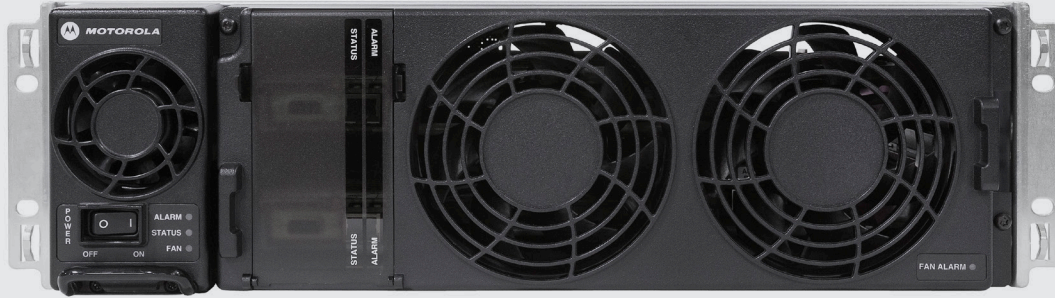
SIMULCAST

When configured for simulcast operation, additional timing and voting equipment allow adjacent sites to utilize the same frequencies with minimal audio degradation. ASTRO 25 sites support both conventional and trunking simulcast systems. Linear Simulcast Modulation (LSM) enables greater spacing without sacrificing coverage or capacity, resulting in fewer sites to build and maintain.

DATA

ASTRO 25 trunking and conventional systems can be enabled with P25 Integrated Data to support basic user data needs. Base station channels can dynamically switch from voice to data based on the call type. ASTRO 25 Enhanced Data optimizes the data channel for applications with a high amount of short inbound data messages like location, telemetry and biometrics, and can improve data efficiency by 12X over standard P25 data.





GTR 8000 BASE RADIO (T7039A)

From conventional to trunking, single repeater to multisite, FDMA to TDMA, and available in multiple frequency bands, the GTR 8000 offers design flexibility and investment protection in a high performance package.

GENERAL SPECIFICATIONS

		700/800 MHz	UHF Range 1 UHF Range 2	VHF	High Power 800 MHz
Size (HxWxD)		5.25 x 19 x 18 in (133 x 483 x 457 mm)			
Weight		46 lb (21 kg)	46 lb (21 kg)	46 lb (21 kg)	48 lb (22 kg)
Temperature Range		-22 to 140 °F (-30 to 60 °C)			
Power Requirements		AC: 90-264 VAC, 47-63 Hz			
		DC: 43.2-60 VDC			
Power Consumption	Efficiency Package	C4FM, FM: 405 W LSM, H-DQPSK: 425 W	C4FM, FM: 410 W LSM, H-DQPSK: 445 W	C4FM, FM: 405 W LSM, H-DQPSK: 315 W	C4FM, FM: 700 W
	Standard	C4FM, FM: 430 W LSM, H-DQPSK: 470 W	C4FM, FM: 435 W LSM, H-DQPSK: 455 W	C4FM, FM: 435 W LSM, H-DQPSK: 345 W	C4FM, FM: 725 W
Antenna Connectors TX		N female			
Antenna Connectors RX	Standard	BNC female			
	Optional Preselector	N female			
Channel Spacing		12.5/25 kHz	12.5/25 kHz	12.5/15/25/30 kHz	12.5/25 kHz
Modulation	TX	C4FM, LSM, H-DQPSK, FM	C4FM, LSM, H-DQPSK, FM	C4FM, LSM, H-DQPSK, FM	FM, C4FM
	RX	C4FM, H-CPM, FM			
Frequency Stability		100 ppb/2 yr or External Reference			

TRANSMITTER

	700/800 MHz	UHF Range 1 UHF Range 2	VHF	High Power 800 MHz
Frequency Range	764-776, 851-870 MHz	380-435, 435-524 MHz	136-174 MHz	851-870 MHz
Power Output	2-100 W	C4FM, FM: 2-110 W H-DQPSK, LSM: 2-100 W	C4FM, FM: 2-100 W H-DQPSK, LSM: 2-60 W	High Power: 15-150 W Low Power: 2-30 W
Electronic Bandwidth	Full Bandwidth			
Modulation Fidelity	5%			
Intermodulation Attenuation	80 dB	65 dB	55 dB	55 dB
Spurious and Harmonic Emissions Attenuation	90 dB			
Analog FM Hum and Noise	12.5 kHz channel	45 dB		
	25 kHz channel	50 dB		
Analog Audio Distortion	<2% at 1000 Hz	<2% at 1000 Hz (Typical: 1%)	<2% at 1000 Hz (Typical: 1%)	<2% at 1000 Hz
Emissions Designators	8K70D1E, 8K70D1D, 8K70D1W, 8K10F1E, 8K10F1D, 8K10F1W, 10K0F1E, 10K0F1D, 10K0F1W, 9K80D7E, 9K80D7D, 9K80D7W, 17K7D7D, 16K0F1D, 16K0F3E, 11K0F3E, 14K0F1D, 14K0F3E, 21K7D7E, 21K7D7D, 21K7D7W	8K70D1E, 8K70D1D, 8K70D1W, 8K10F1E, 8K10F1D, 8K10F1W, 9K80D7E, 9K80D7D, 9K80D7W, 10K0F1D, 11K0F3E, 16K0F1D, 16K0F3E	8K70D1E, 8K70D1D, 8K70D1W, 8K10F1E, 8K10F1D, 8K10F1W, 9K80D7E, 9K80D7D, 9K80D7W, 10K0F1D, 11K0F3E, 16K0F1D, 16K0F3E	High Power: 8K10F1E, 8K10F1D, 8K10F1W, 16K0F1D, 16K0F3E, 11K0F3E, 14K0F1D, 14K0F3E Low Power: 8K10F1D, 8K10F1E, 8K10F7W, 8K70D1W, 8K70D7W, 9K80D7W, 10K0F1D, 11K0F3E, 16K0F3E, 16K0F1D

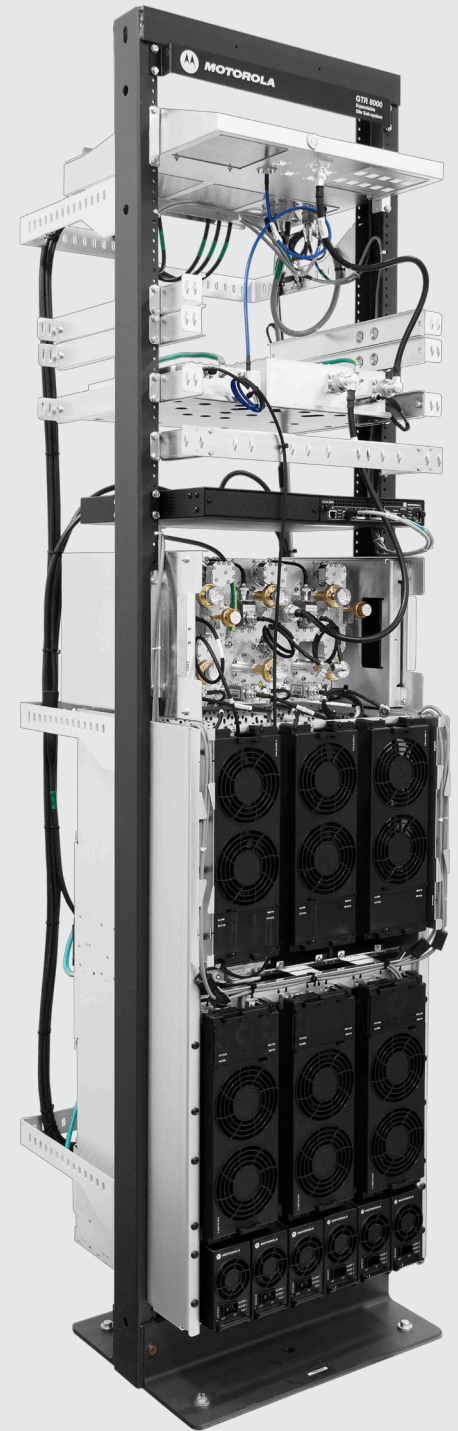
RECEIVER

		700/800 MHz	UHF Range 1 UHF Range 2	VHF	High Power 800 MHz
Frequency Range		792-825 MHz	380-435, 435-524 MHz	136-174 MHz	806-825 MHz
Analog Sensitivity (12 dB SINAD)	12.5 kHz channel	-118 dBm	-118 dBm	-119 dBm	-118 dBm
	25 kHz channel	-117 dBm	-117 dBm	-118 dBm	-117 dBm
Digital Sensitivity (5% BER)	C4FM	-118 dBm	-118 dBm	-119 dBm	-118 dBm
	H-CPM	-116 dBm	-116 dBm	-117 dBm	-116 dBm
Intermodulation Rejection		85 dB			
Digital Adjacent Channel Rejection		60 dB			
Analog Adj Channel Rejection (EIA603)	12.5 kHz channel	75 dB			
Analog Adj Channel Rejection (TIA603D)	12.5 kHz channel	50 or 60 dB (adjustable)			
	25 kHz channel	80 dB			
Spurious and Image Response Rejection	Standard	85 dB	85 dB	90 dB	85 dB
	With optional preselector	100 dB	100 dB	95 dB	100 dB
Analog Audio Response		+1, -3 dB from 6 dB per octave de-emphasis; 300-3000 Hz referenced to 1000 Hz at line output			
Analog Audio Distortion		3% or 5% (adjustable)			
Analog FM Hum and Noise	12.5 kHz channel	45 dB			
	25 kHz channel	50 dB			
Intermediate Frequency	First	73.35 MHz	73.35 MHz	44.85 MHz	73.35 MHz
	Second	2.16 MHz			

GTR 8000 EXPANDABLE SITE SUBSYSTEM (SQM01SUM7054A)

The single rack design of the GTR 8000 Expandable Site Subsystem (ESS) houses up to 6 channels with RF distribution and power systems. Factory-configured and tuned to your specific system, it makes installation quick and easy. Connect multiple ESS racks to achieve maximum site capacity.

GENERAL SPECIFICATIONS						
	700/800 MHz	UHF Range 1 UHF Range 2	VHF	High Power 800 MHz	900 MHz	
Number of Channels	1 to 6	1 to 6	1 to 6	2 to 6	1 to 6	
Height with 7.5 ft Rack	90.4 in (2300 mm)					
Footprint (W x D) with 7.5 ft Rack	20.5 x 23.5 in (520 x 600 mm)					
Weight with 7.5 ft Rack	520 lb (235 kg)	UHF R1: 475 lb (215 kg) UHF R2: 565 lb (260 kg)	475 lb (215 kg)	538 lb (246 kg)	575 lb (260 kg)	
Temperature Range	-22 to 140 °F (-30 to 60 °C)					
Power Requirements	AC: 90-264 VAC, 47-63 Hz, DC: 43.2-60 VDC					
Power Consumption	C4FM, FM	2900 W	2500 W	2650 W	4580 W	3700 W
	LSM, H-DQPSK	3100 W	2700 W	2200 W	N/A	4100 W
	C4FM, FM (Efficiency Package)	2755 W	2325 W	2500 W	4310 W	3700 W
	LSM, H-DQPSK (Efficiency Package)	2900 W	2500 W	2100 W	N/A	4100 W
Antenna Connectors	TX	7/16 or N Female	7/16 Female	N Female	N Female	7/16 Female
	RX	N Female	N Female	BNC Female	N Female	N female
Channel Spacing	12.5/25 kHz	12.5/25 kHz	12.5/15/ 25/30 kHz	12.5/25 kHz	12.5 kHz	
Transmit Combiner Spacing	100 or 150 kHz	150 kHz (450 - 512 MHz) N/A (380-450, 512-524 MHz)	N/A	N/A	12.5 kHz (Hybrid) 150 kHz (Cavity)	
Modulation	TX	C4FM, LSM, H-DQPSK, FM	C4FM, LSM, H-DQPSK, FM	C4FM, LSM, H-DQPSK, FM	FM, C4FM	C4FM, LSM, H-DQPSK
	RX	C4FM, H-CPM, FM	C4FM, H-CPM, FM	C4FM, H-CPM, FM	C4FM, H-CPM, FM	C4FM, H-CPM
Frequency Stability	Repeater Site: 100 ppb/2 yr					
	Simulcast (Multisite): GPS synchronized					



TRANSMITTER (CABINET OUTPUT)

	700/800 MHz	UHF Range 1 UHF Range 2	VHF	High Power 800 MHz	900 MHz
Frequency Range	764-776, 851-870 MHz	380-435, 435-524 MHz	136-174 MHz	851-870 MHz	935-941 MHz
Power Output	1-40 W	C4FM, FM: 2-110 W (380-450, 512-524 MHz) LSM, H-DQPSK: 2-100 W (380-450, 512-524 MHz) C4FM, FM: 1-33 W (450-512 MHz) LSM, H-DQPSK: 1-30 W (450-512 MHz)	C4FM, FM: 2-100 W LSM, H-DQPSK: 2-60 W	13-134 W	2-way Hybrid: 1-37 W 3-way Hybrid: 1-22 W 4-way Hybrid: 1-17 W 5-way Hybrid: 1-12 W 6-way Hybrid: 1-10 W
Modulation Fidelity	5%				
Intermodulation Attenuation	80 dB	80 dB (450-512 MHz), 65 dB (380-450, 512-524 MHz)	55 dB	55 dB	80 dB
Spurious / Harmonic Emissions Attenuation	90 dB				
Analog FM Hum / Noise	12.5 kHz channel	45 dB	45 dB	45 dB	TBA
	25 kHz channel	50 dB	50 dB	50 dB	TBA
Analog Audio Distortion	<2% at 1000 Hz, 1% typ for UHF and VHF bands				
Emissions Designators	8K70D1E, 8K70D1D, 8K70D1W, 8K10F1E, 8K10F1D, 8K10F1W, 10K0F1E, 10K0F1D, 10K0F1W, 9K80D7E, 9K80D7D, 9K80D7W, 17K7D7D, 16K0F1D, 16K0F3E, 11K0F3E, 14K0F1D, 14K0F3E, 21K7D7E, 21K7D7D, 21K7D7W	8K70D1E, 8K70D1D, 8K70D1W, 8K10F1E, 8K10F1D, 8K10F1W, 9K80D7E, 9K80D7D, 9K80D7W, 10K0F1D, 11K0F3E, 16K0F1D, 16K0F3E	8K70D1E, 8K70D1D, 8K70D1W, 8K10F1E, 8K10F1D, 8K10F1W, 9K80D7E, 9K80D7D, 9K80D7W, 10K0F1D, 11K0F3E, 16K0F1D, 16K0F3E	8K10F1E, 8K10F1D, 8K10F1W, 10K0F1E, 10K0F1D, 10K0F1W, 16K0F1D, 16K0F3E, 11K0F3E, 14K0F1D, 14K0F3E	8K70D1E, 8K70D1D 8K70D1W, 8K10F1E 8K10F1D, 8K10F1W 9K80D7E, 9K80D7D 9K80D7W, 10K0F1D 11K0F3E, 16K0F1D 16K0F3E

Does not include Transmitter RF Distribution System for VHF, UHF 380-450, 512-524 MHz and High Power 800 MHz.

RF DISTRIBUTION SYSTEM (TX)

	700/800 MHz Cavity	900 MHz Hybrid	UHF Cavity
Frequency Range	764-776 MHz 851-870 MHz	935-941 MHz	450-512 MHz
Insertion Loss (150 kHz spacing)	3.1 dB typ	2-way loss: 4.4 dB typ 3-way loss: 6.3 dB typ 4-way loss: 7.6 dB typ 5-way loss: 8.8 dB typ 6-way loss: 9.7 dB typ	4.5 dB typ
Tx-Tx Isolation (150 kHz spacing)	32 dB	20 dB	32 dB

RF DISTRIBUTION SYSTEM (RX)

	700/800/900 MHz	UHF
Frequency Range	792-825 MHz or 896-902 MHz	450-512 MHz
Noise Figure	Typ / Limit	3.8 / 5 dB
Gain	Typ / Limit	13 / -16 to 24 dB adjustable
3rd Order Output Intercept (Typ)	21 dBm	19 dBm
Amplifier Intercept	35 dBm	40 dBm
Preselector Bandwidth	792-825 MHz or 896-902 MHz	2 or 3.5 MHz
RF Input Connector Type	N (Female)	N (Female)
RF Output Connector Type	BNC (Female)	BNC (Female)

RECEIVER (TOP OF CABINET)

	700/800 MHz	UHF Range 1 UHF Range 2	VHF	High Power 800 MHz	900 MHz
Frequency Range	792-825 MHz	380-435, 435-524 MHz	136-174 MHz	806-825 MHz	896-902 MHz
Analog Sensitivity (12 dB SINAD)	12.5 kHz channel	-123 dBm (380-450, 512-524 MHz) -121.5 dBm (450-512 MHz)	-118 dBm (12.5/15 kHz)	-123 dBm	N/A
	25 kHz channel	-122 dBm (380-450, 512-524 MHz) -120.5 dBm (450-512 MHz)	-117 dBm (25/30 kHz)	-122 dBm	N/A
Digital Sensitivity (5% BER)	C4FM	-123 dBm (380-450, 512-524 MHz) -121.5 dBm (450-512 MHz)	-118 dBm	-123 dBm	-123 dBm
	H-CPM	-121 dBm (380-450, 512-524 MHz) -119.5 dBm (450-512 MHz)	-116 dBm	N/A	-118.5 dBm
Intermodulation Rejection	80 dB				
Digital Adjacent Channel Rejection	60 dB				
Analog Adjacent Channel Rejection (EIA603)	12.5 kHz channel	75 dB	75 dB	75 dB	N/A
Analog Adjacent Channel Rejection (TIA603D)	12.5 kHz channel	50 or 60 dB (adjustable)	50 or 60 dB (adjustable)	50 or 60 dB (adjustable)	N/A
	25 kHz channel	80 dB	80 dB	80 dB	N/A
Spurious and Image Response Rejection	100 dB	85 dB (380-435 MHz)	90 dB	100 dB	100 dB
		100 dB (450-512 MHz)			
Analog Audio Response	+1, -3 dB from 6 dB per octave de-emphasis; 300-3000 Hz referenced to 1000 Hz at line output				N/A
Analog Audio Distortion	3% or 5% (adjustable)	3% or 5% (adjustable)	3% or 5% (adjustable)	3% or 5% (adjustable)	N/A
Analog FM Hum / Noise	12.5 kHz channel	45 dB	45 dB	45 dB	N/A
	25 kHz channel	50 dB	50 dB	50 dB	N/A
Intermediate Frequency	First	73.35 MHz	73.35 MHz	44.85 MHz	73.35 MHz
	Second	2.16 MHz			

GCM 8000 COMPARATOR (T7321A)
GENERAL SPECIFICATIONS

TRUNKING SYSTEMS	
Channel Capacity	1 or 2
Size (HxWxD)	5.25 x 19 x 18 in (133 x 483 x 457 mm)
Weight	40 lb (18 kg)
Temperature Range	-22 to 140°F (-30 to 60°C)
Rack Option	19 in standard rack mountable
Time Stability	External Reference
Power Requirements	AC: 90-264 VAC 47-63Hz DC: 43.2-60 VDC
Power Consumption	AC: 1 module 130 W AC: 2 modules 160 W DC: 1 module 60 W DC: 2 modules 80 W

GRV 8000 COMPARATOR (T8341A)
GENERAL SPECIFICATIONS

CONVENTIONAL SYSTEMS	
Channel Capacity	1 or 2
Size (HxWxD)	5.25 x 19 x 18 in (133 x 483 x 457 mm)
Weight	36 lb (16 kg)
Temperature Range	-22 to 140°F (-30 to 60°C)
Rack Option	19 in standard rack mountable
Time Stability	External Reference
Power Requirements	AC: 90-264 VAC 47-63Hz DC: 43.2-60 VDC
Power Consumption	AC: 1 module 80 W AC: 2 modules 105 W DC: 1 module 50 W DC: 2 modules 75 W

GPW 8000 RECEIVER (T7540A)

GENERAL SPECIFICATIONS

		700/800 MHz	UHF Range 1	VHF	900 MHz
Frequency Range		792-825 MHz	380-435, 435-524 MHz	136-174 MHz	896-902 MHz
Size (HxWxD)		5.25 x 19 x 18 in (133 x 483 x 457 mm)			
Weight		36 lb (16 kg)			
Temperature Range		-22 to 140°F (-30 to 60°C)			
Power Requirements		AC: 90-264 VAC 47-63Hz			
		DC: 43.2-60 VDC			
Power Consumption (1 Module / 2 Modules)	AC - Power Efficiency Package	40 / 65 W			
	DC - Power Efficiency Package	30 / 50 W			
	AC	80 / 105 W			
	DC	50 / 75 W			
Antenna Connectors	Standard	BNC Female			
	With Optional Preselector	N Female			
Modulation		C4FM, FM			
Frequency Stability		Conventional: 100 ppb/2 yr			
Analog Sensitivity (12 dB SINAD)	12.5 kHz channel	-118 dBm	-118 dBm	-119 dBm (12.5/15 kHz)	N/A
	25 kHz channel	-117 dBm	-117 dBm	-118 dBm (25/30 kHz)	N/A
Digital Sensitivity (5% BER)	C4FM	-118 dBm	-118 dBm	-119 dBm	-118 dBm
	H-CPM	-116 dBm	-116 dBm	-117 dBm	-116 dBm
Intermodulation Rejection		85 dB	85 dB	85 dB	N/A
Digital Adjacent Channel Rejection		60 dB	60 dB	60 dB	N/A
Analog Adjacent Channel Rejection (EIA603)	12.5 / 25 kHz channel	75 dB	75 dB	75 dB	TBA
Analog Adjacent Channel Rejection (TIA603D)	12.5 kHz channel	50 or 60 dB (adjustable)	50 or 60 dB (adjustable)	50 or 60 dB (adjustable)	TBA
	25 kHz channel	80 dB	80 dB	80 dB	TBA
Spurious and Image Response Rejection	Standard	85 dB	85 dB	90 dB	90 dB
	With Optional Preselector	100 dB	100 dB	95 dB	N/A
Analog Audio Response		+1, -3 dB from 6 dB per octave de-emphasis; 300-3000 Hz referenced to 1000 Hz at line output			
Analog Audio Distortion		3% or 5% (adjustable)			
Analog FM Hum and Noise	12.5 kHz channel	45 dB			
	25 kHz channel	50 dB			
Intermediate Frequency	First	73.35 MHz	73.35 MHz	44.85 MHz	73.35 MHz
	Second	2.16 MHz			

GCP 8000 SITE CONTROLLER (T7038A)

GENERAL SPECIFICATIONS

Channel Capacity	Repeater Site: 28	Rack Option	19 in standard rack mountable
	Simulcast (Multicast): 30	Frequency Stability	Simulcast (Multisite): External
Size (HxWxD)	5.25 x 19 x 18 in (133 x 483 x 457 mm)	Power Requirements	AC: 90-264 V, 47-63 Hz or DC: 43.2-60 V
Weight	40 lb (18 kg)	Power Consumption	AC: 130 W, DC: 60 W
Temperature Range	-22 to 140 °F (-30 to 60 °C)		



G-SERIES COMPACT SITE

Protected from the elements, the G-Series Compact Site is a complete ASTRO 25 site that can house up to three GTR 8000 Base Radios in an outdoor, environmentally controlled cabinet. It is ideal for Project 25 (P25) deployments where building enclosures are not cost effective or not feasible due to difficult terrain.

Frequency Band	700 MHz, 800 MHz
Size (HxWxD)	51.2 x 27.2 x 36.5 in (1300 x 690 x 925 mm): Pole Mount 59.5 x 27.2 x 36.5 in (1510 x 690 x 925 mm): Pad Mount 55.3 x 27.2 x 36.5 in (1405 x 690 x 925 mm): Wall Mount
Weight	230 lb (104 kg) empty, 460 lb (209 kg) fully loaded
Temperature Range (External to Cabinet)	-22 to 122 °F (-30 to 50 °C)
Mounting Options	Pole, Pad, or Wall Mountable



SERVICES

Choose the right level of services you need to achieve mission-critical performance for your ASTRO 25 system. The more you engage Motorola Solutions, the more you transfer the risk to us and achieve peace of mind in maximizing your uptime.



ESSENTIAL

Technical support when and where you need it, so you can maintain and restore your system.



ADVANCED

Rely on us to monitor and update your network, providing improved network response and continuity.



PREMIER

Transfer day-to-day accountability to us to operate and optimize all or part of your system to maximize performance and reduce risk.



FCC TYPE ACCEPTANCE

Frequency Range	Type	Power Output	Type Acceptance Number
136-174 MHz	Transmitter	2-100 W	ABZ89FC3790B, ABZ89FC3799B
136-174 MHz	Receiver	N/A	ABZ89FR3791B
406-435 MHz	Transmitter	2-110 W	ABZ89FC4821B
406-435 MHz	Receiver	N/A	ABZ89FR4822B
435-512 MHz	Transmitter	2-110 W	ABZ89FC4819B
435-512 MHz	Receiver	N/A	ABZ89FR4820B
764-776 MHz	Transmitter	2-100 W	ABZ89FC5812B
851-870 MHz	Transmitter	2-100 W	ABZ89FC5810B
792-825 MHz	Receiver	N/A	ABZ89FR5811B
935-941 MHz	Transmitter	2-120 W	ABZ89FC5823B
896-902 MHz	Receiver	N/A	ABZ89FR5824B
851-870 MHz	Transmitter	15-150 W	ABZ89FC5825B

EU REGULATORY COMPLIANCE

CE mark is available on the GTR 8000 Base Radio (T7039A) and GPW 8000 Receiver (T7540A) in the following frequency ranges: UHF 380-525 MHz and VHF 136-174 MHz.

NOTES

- All specifications shown are typical unless otherwise noted.
- All specifications are subject to change without notice.

For more information, please visit us on the web at: www.motorolasolutions.com/ASTRO



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