

# Panaray® Sound-Reinforcement Loudspeakers

Full-range cone array loudspeakers for installed applications.



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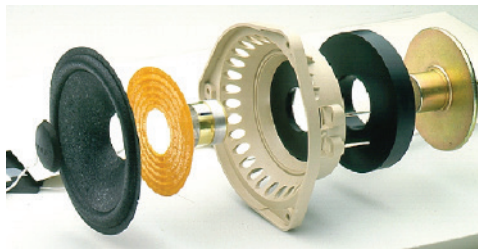
Panaray sound-reinforcement loudspeakers feature full-range cone transducers in proprietary array configurations that provide exceptional reliability in adverse conditions, while delivering natural vocal clarity. For more than five decades, Bose® has been improving the performance of full-range cone transducers to provide unmatched reliability, natural sound quality, and wide coverage patterns. Available in both point-source and column line array acoustic designs, Panaray loudspeakers cover a wide variety of installed-sound venues, for indoor and outdoor locations.

### From the legendary Bose® 901® to the Professional 802®

Bose first demonstrated the advantages of full-range cone driver arrays with the revolutionary 901 Direct/Reflecting® high-fidelity loudspeaker. Based on extensive research in the fields of speaker design and psychoacoustics, the groundbreaking speaker system won immediate acclaim for its extraordinary ability to more closely approximate the essence and emotional impact of a live concert.

After noting that professional musicians were using Bose 901 speakers as PA speakers, the company developed the Bose 800, which maximized sound quality through use of eight 4.5-inch drivers, and formed the Bose Professional Division. This same acoustic design was refined in the Bose Panaray 802 and became one of the world's best-selling sound-reinforcement loudspeakers.

### The extraordinary Bose 4.5-inch full-range cone driver



The key technology of the 802 loudspeaker is the full-range cone driver. Years of research have optimized the combination of power handling, efficiency, smooth frequency response, and wide dispersion. More than 30 years and millions of units in production have proven this is one of the most reliable

acoustic transducers in the world, with 99.9% still operating after 5 years.

The Bose 4.5-inch full-range cone driver pioneered many innovations in transducer design, including aluminum helical voice-coil wire to improve efficiency, polyester-resin frames for more precise manufacture, and Kevlar® impregnated cones to resist outdoor environmental conditions.



### Second generation: the Bose 2.25-inch full-range cone driver

With a desire to improve the high-frequency summation in column line arrays, Bose developed the second generation full-range cone driver, with a 50% reduction in diameter. The 2.25-inch size provides increased horizontal dispersion and higher frequency summation for vertical arrays. Additionally, the smaller form factor allows denser packing of transducers for increased output in small enclosures. The first Bose Professional product to utilize the 2.25-inch full-range driver was the Panaray MA12, which launched a resurgence in the column line array category by providing exceptional vocal clarity in difficult acoustic spaces and packaging the drivers in a slim enclosure that visually blends with any décor.



### Latest advancement: 2.25-inch cone arrays with coaxial woofers

The most recent performance advancement for Bose Professional cone-array loudspeakers combines the advantages of 2.25-inch cone drivers in mid/high column line arrays with coaxially mounted woofers for increased low-frequency response and maximum output level.



### Current available products

Today, Bose full-range cone transducers continue to be the mainstay of Bose Professional's most popular Panaray and FreeSpace® loudspeaker lines. Extending from small 16 watt models, such as the FreeSpace DS 16 loudspeaker, to the F1 Flexible Array Loudspeaker, Bose full-range cone transducers bring outstanding coverage and frequency response to nearly any premium background/foreground application.

## Panaray® Full-Range Cone-Array Loudspeakers

Point-Source Acoustics (*wide vertical coverage*)

## Panaray 802® Series IV



One of the best-selling sound-reinforcement loudspeakers in the world is now in its 4th generation. The 802 Series IV loudspeaker features eight full-range drivers arranged in a proprietary Articulated Array™ design, delivering broad coverage, extension down to 50 Hz and natural vocal clarity – all in a small, lightweight and weather-resistant enclosure.

- Eight 4.5" full-range drivers
- 52 - 15,000 Hz range
- 120° x 100° coverage pattern
- 123 dB maximum peak SPL
- Indoor or Outdoor



## Panaray 402® Series IV



The compact enclosure of the 402 Series IV loudspeaker contains four full-range drivers arrayed for tighter vertical coverage. Compared to the 802 model, the 402 delivers similar output level and horizontal coverage, but less bass extension. For smaller venues requiring a high-value solution, a single 402 loudspeaker is capable of covering an entire listening area for accurate speech and music reproduction.

- Four 4.5" full-range drivers
- 73 - 15,000 Hz range
- 120° x 60° coverage pattern
- 119 dB maximum peak SPL
- Indoor or Outdoor



## Panaray 502® A



The Panaray® 502 A features five full-range drivers that deliver the most consistent coverage pattern versus frequency within the Panaray line. The slightly curved, narrow enclosure has an elegant design that blends with any décor. For speech program material, a single loudspeaker can cover smaller venues. Additional subwoofers are required for use with full-range music content.

- Five 4.5" full-range drivers
- 103 - 15,000 Hz range
- 120° x 70° coverage pattern
- 117 dB maximum peak SPL
- Indoor only

Column Line Array Acoustics (*narrow vertical coverage*)

## Panaray MA12EX



The MA12EX modular line array loudspeaker builds off of the popular MA12 version with articulated arrays to improve horizontal coverage, increased low-frequency response, and weather-rated materials to allow outdoor installation. With bass extension down to 75 Hz, the MA12EX loudspeaker can be used without additional subwoofers in some types of full-range music program applications.

- Twelve 2.25" full-range drivers
- 75 - 13,000 Hz range
- 160° x 20° coverage pattern
- 119 dB maximum peak SPL
- Indoor or Outdoor

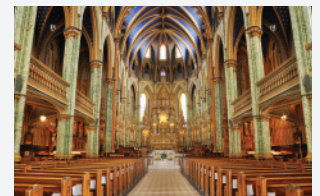


## Panaray MA12



Known for its outstanding vocal intelligibility in acoustically demanding spaces, the Panaray MA12 modular line array loudspeaker features a full-range 12-element design in a slim and unobtrusive enclosure. Multiple units can be vertically stacked to improve coverage control and projection distance. Appropriate for vocal and light music, or full-music program with additional subwoofers.

- Twelve 2.25" full-range drivers
- 100 - 16,000 Hz range
- 145° x 20° coverage pattern
- 126 dB maximum peak SPL
- Indoor only



## Panaray® Loudspeaker Specification Summary

	Point Source			Column Line Array	
	802 Series IV	402 Series IV	502 A	MA12EX	MA12
					
<b>System Performance</b>					
Frequency Range (-10 dB) <sup>1</sup>	52 Hz - 15 kHz	73 Hz - 15 kHz	103 Hz - 15 kHz	58 Hz - 16 kHz	100 Hz - 16 kHz
Coverage Pattern, Horizontal	120°	120°	120°	160°	145°
Coverage Pattern, Vertical <sup>2</sup>	100°	60°	70°	20°	20°
Power Handling, Long-Term <sup>3</sup>	300 W	150 W	200 W	200 W	400 W
Calculated Maximum SPL @ 1 m, peak <sup>4</sup>	123 dB	119 dB	117 dB	119 dB	126 dB
Active EQ Required	yes	yes	yes	yes	yes
<b>Transducers</b>					
Full-Range	Eight 4.5" cone drivers	Four 4.5" cone drivers	Five 4.5" cone drivers	Twelve 2.25" cone drivers	Twelve 2.25" cone drivers
Nominal Impedance	8 ohms	8 ohms	8 ohms	8 ohms	8 ohms
<b>Physical</b>					
Dimensions (H x W x D), mm	336 mm x 523 mm x 335 mm	592 mm x 206 mm x 202 mm	603 mm x 146 mm x 179 mm	985 mm x 104 mm x 139 mm	984 mm x 105 mm x 128 mm
Dimensions (H x W x D), inches	13.3" x 20.5" x 13.2"	23.3" x 8.1" x 8.0"	23.8" x 5.8" x 7.1"	38.8" x 4.1" x 5.5"	38.8" x 4.2" x 5.0"
Net Weight	13.6 kg (30 lbs)	7.3 kg (16 lbs)	6.8 kg (15 lbs)	9.4 kg (21 lbs)	8.5 kg (19 lbs)
Finish Color	Black	Black or White	Black or White	Black or White	Black or White
Environmental Rating	Outdoor (IP55)	Outdoor (IP55)	Indoor	Outdoor (IP55)	Indoor

### Footnotes:

1. Frequency range measured on-axis with recommended active EQ in an anechoic environment.
2. For MA12EX and MA12, vertical coverage varies by number of modules vertically arrayed and distance from line-source.
3. Power handling using AES test: pink noise, IEC268-5 filtered, 6 dB crest factor, 2-hour duration, with recommended EQ.
4. Maximum SPL calculated from sensitivity and AES power handling specifications, exclusive of power compression.

## Optional Accessories

Subwoofers				Floor Monitors	
RoomMatch® RMS215	MB24 / MB24 WR	MB12 / MB12 WR	Panaray MB4	Panaray 620M	Panaray 310M
					

## System Performance

Frequency Range (-10 dB)	40 – 280 Hz	36 – 290 Hz	36 – 290 Hz	35 – 350 Hz	55 Hz - 19 kHz	55 Hz - 19 kHz
Coverage Pattern (H x V)	omni	omni	omni	omni	120° x 40°	120° x 160°
Long-Term Power Handling <sup>3</sup>	500 + 500 W	400 + 400 W	400 W	200 W	200 W	100 W
Calculated Maximum SPL @ 1 m, peak <sup>4</sup>	139 dB	135 dB	129 dB	122 dB	119 dB	117 dB

## Transducers

High Frequency	none	none	none	none	Six 2.25" cone drivers	Three 2.25" cone drivers
Low Frequency	Two 15" woofers	Two 12" woofers	One 12" woofer	Four 5.25" woofers	Two 5.25" woofers	One 5.25" woofer
Nominal Impedance	8 + 8 ohms	8 + 8 ohms	8 ohms	8 ohms	8 ohms	8 ohms

## Physical

Dimensions (H x W x D), mm	446 mm x 942 mm x 546 mm	713 mm x 508 mm x 646 mm	374 mm x 508 mm x 646 mm	678 mm x 260 mm x 463 mm	318 mm x 523 mm x 266 mm	318 mm x 361 mm x 211 mm
Dimensions (H x W x D), inches	17.6" x 37.1" x 21.5"	28.1" x 20.0" x 25.4"	14.7" x 20.0" x 25.4"	26.7" x 10.2" x 18.2"	12.5" x 20.6" x 10.5"	12.5" x 14.2" x 8.3"
Net Weight	59.9 kg (132 lbs)	64.4 kg (142 lbs)	35.4 kg (78 lbs)	20 kg (45 lbs)	10 kg (22 lbs)	6 kg (14 lbs)
Finish Color	Black	Black or White	Black or White	Black or White	Black	Black
Environmental Rating	Indoor	Indoor/Outdoor (WR)	Indoor/Outdoor (WR)	Indoor	Indoor	Indoor

## Installation Brackets

802 Series IV	402 Series IV	502A	MA12EX / MA12	70/100V Transformers
 WCB802IV  WBP-8  SB-8	 SB-4  RMUBRKT1 (indoor) WBPWR-50 (outdoor)	 SB-5  WCB-5  WBP-5	 WMB-MA12/MA12EX  WMB2-MA12/MA12EX	 CVT-MA12  CVT-MA12EX

Images not to scale. For additional specifications and application information, please visit [pro.bose.com](http://pro.bose.com). Specifications subject to change without notice.

## PowerMatch® Configurable Power Amplifiers



**PowerMatch PM8500/8250/4500/4250  
configurable power amplifiers**

- Optimal power levels and loudspeaker DSP for Panaray® loudspeakers
- Four models, up to 4,000 watts rated power
- 4 and 8 channel Class-D amplification for installed applications
- Proprietary DFL™ system for outstanding audio quality, configurability, efficiency and reliability
- QuadBridge™ channel pairing technology bridges 2 or 4 channels for higher power options
- Outputs designed to drive 70/100V without a transformer or 2/4/8-ohm loads
- Front-panel interface or PC control using ControlSpace® Designer™ software
- Optional Dante™, CobraNet®, ESPLink or AES3 digital input cards



**Dante™**



**Bose ESPLink**



**CobraNet®**



**AES3**

## ControlSpace® Processors



**ControlSpace ESP-880/1240/4120/1600 and  
ESP-00 II engineered sound processors**

- High-quality audio processing and control
- Models include four fixed-I/O processors and one flexible card-frame chassis
- Dante™ network audio expansion options available for all models
- Five elegant wall-plate user interfaces available
- Mobile device control via ControlSpace Remote app
- Full network configuration and control with ControlSpace Designer™ software



**ControlSpace SP-24 sound processor**

- 2 in x 4 out loudspeaker control for Panaray loudspeakers
- Presets for loudspeaker EQ, bandpass filters, limiting, delay and routing
- SP-24 Editor software (PC) for real-time control via USB
- Recallable scenes and basic editing from front-panel interface

## Portable PA Systems

- First powered portable system with selectable vertical coverage
- 1,000-watt modules with built-in mixer and EQ settings
- J-position, Reverse-J, C-position, and Straight coverage shapes
- 2.25-inch cone-transducer array with coaxial-mounted 12-inch woofer
- Top and rear mounting inserts (M8) for fixed installations



**The Bose® F1 Model  
812 Flexible Array  
Loudspeaker and F1  
Subwoofer**

- Bracket options include U-Bracket, Pan/Tilt, and Yoke-style
- Bose F1 Subwoofer provides significant bass extension and output for its size
- F1 Sub includes built-in stand for F1 Model 812
- Lightweight, compact enclosures with strategically-placed transport handles



**L1 Portable Line  
Array Systems**

- Three models include Compact, Model IS, and Model II
- Highly portable for soloists, DJs, and general use
- Designed for use as combined PA and monitor system
- Fixed vertical control with up to 180° horizontal
- ToneMatch® audio engine and bass module options for Model IS and Model II

## About Bose Professional

Professional sound systems demand an uncommon expertise and specialized products. Bose Professional is a dedicated group of engineers, product managers, technical support specialists and customer service teams that are focused on the professional audio markets. For more than three decades, the Professional Division has developed innovative loudspeakers, electronics and software to meet the needs of demanding professional applications.

Bose Professional products are sold only through authorized pro-audio dealers, AV-system integrators and distributors. We provide substantial support for our distribution network, including product technical information, system design support and after-sale support. Bose® sound is found throughout the world in performing arts centers, theaters, houses of worship, stadiums, restaurants, retail stores, corporate buildings and hospitality establishments.

## About Bose Corporation

Bose Corporation was founded in 1964 by Dr. Amar G. Bose, professor at the Massachusetts Institute of Technology. Today, the company is primarily known for its research in acoustics, which has produced inventions that have improved the performance of:

- Loudspeakers
- Home entertainment systems
- Automotive music systems designed for the interior acoustics of each car model (first introduced by Bose)
- Noise reducing headsets for pilots and the public (first commercialized by Bose)
- Sound in public spaces
- The production of sound for musicians requiring electronic amplification of their instruments
- Materials testing and durability simulation instruments for biomedical applications
- Driver suspension systems for heavy-duty trucks



