

By Mark Frink

Digitally Steerable Arrays ("DSA") are a relatively new type of loudspeaker system that are not only self-powered, but also employ individual processing for each transducer to control the coverage of the entire array. Using advanced, but well-known techniques of gain-, delay- and frequency-shading, the polar response of an array of transducers can be steered differently than it would behave passively. Steve "Woody" LaCerra discussed DSAs at length in last month's issue.

DSAs employ a line-source form-factor, a vertical column of identical transducers that are closely spaced for the most part. Like unprocessed architectural columns, DSAs typically provide fixed horizontal coverage of about 100 degrees. However, their vertical coverage, usually fairly narrow in tall enough passive line sources, can be directed downwards, can be opened up to cover a wider vertical angle or can sometimes even be split to fire above and below architectural obstructions, such as balcony fascia.

Architectural columns originally found favor for announcements and spoken word in public spaces like train stations, airports and churches: cavernous buildings with reflective surfaces that challenge intelligibility with diminished direct-to-reverberant ratios when distributed point-source speakers are employed. While columns provide wide coverage with limited vertical spill, aiming them down to better address listening areas requires tilting the enclosures at an angle, less aesthetically pleasing than mounting them flush to a wall. More importantly, physically angling passive columns tips coverage at the farthest reach, but doesn't change coverage at the sides.

Both passive columns and DSAs are getting a boost from changes to the National Fire Code that

require Emergency Voice Alarm Communications Systems (EVACS) and Mass Notification Systems (MNS) for non-fire emergencies, and there's an intelligibility requirement. Additionally, a variety of modern public spaces, from shopping malls to auditoriums and symphony halls, don't want or need to own a high-power concert-quality sound system, but have regular use for a Public Announce (PA) system that also satisfies fire and emergency enunciation requirements.

In addition to DSAs' ability to steer coverage, a further benefit is that most can be programmed with presets that can adjust coverage for different applications. One setting might only cover the floor or orchestra level of a hall, while another might reach further into the room or split coverage into a second beam to hit a balcony.

Columns of drivers have a limit to coupling at higher frequencies, determined by the distance between acoustic centers, limiting their ability to project the highest octaves. The high-fidelity solution is to supplement a column of cones with a high frequency array. Some products integrate these into the enclosure, while others provide them in a second box. Low frequency pattern control is determined by array length, so many provide supplemental low frequency columns to extend the array's length. For musical applications, even a fairly tall array benefits from the addition of subwoofers.

Finally, a recent development is modular multi-way DSAs, systems made of multiple identical two- or three-way enclosures that are assembled into vertical arrays to provide high SPL and full bandwidth audio for larger concert applications. **FOH**



Renkus-Heinz

Renkus-Heinz IC Live

Configuration:	2-way column
Amp channels:	(8) 100W
HF drivers:	(3) 1-inch
LMF drivers:	(5) 6.5-inch
Frequency resp.	80 to 20,000 Hz
Size (HxWxD):	48 x 8 x 11.3 inches
Weight:	61 lbs.
Horizontal:	120°
Vertical:	20°, 25° & 30°
Double-stacked:	5°, 10°, 15° and 20°
Steering:	+/- 30° V
LF supplement:	IC215-S dual 15 sub

renkus-heinz.com

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Bosch

LA3 Vari-directional Array VARI-BH & VARI-E

Configuration:	Co-axial 2-way
Amp channels:	(8) 15W & (4) 25W
Full Range drivers:	(8) 4-inch co-axial
Frequency resp.	130 to 18,000 Hz
Size (HxWxD):	47 & 47.2 x 5.1 x 3.8 inches
Weight:	28.7 & 25.8 lbs.
Horizontal:	130°
Vertical:	10° to 60°
Steering:	+/- 30° V
LMF extension:	VARI-E w/ (8) 4-inch

boschsecurity.com

Bosch LA3 Vari-directional Array
VARI-BH & VARI-E

Duran Audio

AXYS Intellivox 808 & 1608

Configuration:	2-way column, 2 models
Amp channels:	(8 or 16) 100W
HF drivers:	(2) 1-inch
LMF drivers:	(6 or 14) 6.5-inch
Frequency resp.	130 to 18,000 Hz
Size (HxWxD):	50 or 147 x 7.8 x 6.1 inches
Weight:	82 or 172 lbs.
Horizontal:	110°
Vertical:	6° to 14°
Steering:	+/- 20° V

duran-audio.com

Duran AXYS Intellivox
1608 & 808

Martin Audio

Martin Audio MLA & MLD

Configuration:	3-way, large-format modular
Amp channels:	(6) 3,000W total
HF drivers:	(3) 1-inch
MF drivers:	(2) 6.5-inch horn loaded
LF drivers:	(2) 12-inch hybrid horn loaded
Frequency resp.	58 to 19,000 Hz
Size (HxWxD):	15 x 40 x 28 inches
Weight:	187 lbs.
Horizontal:	90°
Vertical:	7.5° per enclosure
Steering:	+5° / -20°
Down-fill:	MLD 120° x 20°
LF supplement:	MLX dual 18-inch sub

martin-audio.com

Martin Audio MLA

RCF

RCF TTL 11A-H & 11A-B

Configuration:	3-way column, 2-box system
Amp channels:	(4) 250W, (3) 350W, (2) 1kW
HF & MF drivers:	(4) 1.5-inch & (3) 8-inch
LF drivers:	(4) 8-inch
Frequency resp.	60 to 20,000 Hz
Size (HxWxD):	95 x 10.3 x 9.5 inches
Weight:	168 lbs.
Horizontal:	90°
Vertical:	10° to 40°
Steering:	-10° V
LF supplement:	TTS-25A single 15-in. sub

rcf.it

RCF TTL 11A-H & 11A-B

FBT

Vertus MLA 801a & 608a

Configuration:	2-way column, 2-box system
Amp channels:	(8) 30W, (6) 200W
HF drivers:	(8) 0.75-inch
LMF drivers:	(6) 8-inch
Frequency resp.	60 to 20,000 Hz
Size (HxWxD):	75 (24 & 50) x 9.5 x 9.5 inches
Weight:	40 & 60 lbs.
Horizontal:	90°
Vertical:	5° to 25°/40°
Steering:	+5°/-25° V
LF supplement:	Mitus 118Sa single 18-in. sub

fbt.it

FBT Vertus MLA 801
608a & 801a

Meyer Sound

CAL 96, 64 & 32

Configuration:	2-way column, 3 models
Amp channels:	(96, 64 or 32)
HF drivers:	(72, 48 or 24) 20-mm
LMF drivers:	(24, 16 or 8) 4-inch
Frequency resp.	150 to 10,000 Hz
Size (HxWxD):	120, 90 or 55 x 7.8 x 8.1 inches
Horizontal:	120°
Vertical:	5° to 60°
Steering:	+/- 30° V
LF supplement:	500 HP dual 15-inch sub

meyersound.com

Meyer Sound CAL
96, 64 & 32

Renkus-Heinz

Renkus-Heinz IC2

Configuration:	2-way modular system
Amp channels:	(8) 250W
HF drivers:	(4) 1-inch
LMF drivers:	(4) 8-inch
Frequency resp.	60 to 20,000 Hz
Size (HxWxD):	18.5 x 28.5 x 11.5 inches
Weight:	75 lbs.
Horizontal:	120°
Vertical:	20° to 60°
Steering:	+/- 30° V
LF supplement:	IC212-S dual 12-in. sub

renkus-heinz.com

Renkus-Heinz IC2

Tannoy

Qflex16 & Qflex8

Configuration:	3-way system, 2-box column
Amp channels:	(16) 100W
HF drivers:	(8) 1-inch
LMF drivers:	(8) 3-inch
Frequency resp.	110 to 20,000 Hz
Size (HxWxD):	29.3 & 33 x 6.7 x 5.9 inches
Weight:	31 & 33 lbs.
Horizontal:	120°
Vertical:	10° to 100°
Steering:	+/- 70° V
LF extension:	Qflex 8 w/ (8) 4-in. woofers

tannoy.com

Tannoy Qflex16 & Qflex8