

Sports Sound

Loudspeaker System
Design Reference Guide





Recommended Effective Operating Distances

Reference: 96 dB

Model	Description	Feet		30	40	50	60	70	80	90	100	150	160	170	180	190	200	210	220	230	240	250	300+	
		Meters		9	12	15	18	21	24	27	30	46	49	52	55	58	61	64	67	70	73	76	90+	
R.15COAX	2-way, Coaxial; LF: 1 x 6", HF: 1 x 1"			32' / 10m																				
R.35COAX*	2-way, Coaxial; LF: 1 x 10", HF: 1 x 1.25"		52' / 16m																					
R.25-94Z	2-way, LF: 1 x 8", HF: 1 x 1"		49' / 15m																					
R.35-3896*	3-way; LF: 1 x 8", MF: 2 x 2.35", HF: 1 x 1"			83' / 25m																				
R.5COAX66/99**	2-way, LF: 1 x 12", HF: 1 x 1"			60' / 18m																				
R.5-66/94/99Z**	2-way, LF: 1 x 12", HF: 1 x 1"				90' / 27m																			
R1-64,66,94**	2-way, LF: 1 x 12", HF: 1 x 1"					148' / 45m																		
R.5HP	3-way; LF: 1 x 12", MF: 1 x 2"; HF: 1 x 1"					150' / 46m																		
R.5-66/96MAX	2-way; LF: 1 x 12", HF: 1 x 1.4"					150' / 46m																		
R2-64/66/94MAX	3-way; LF: 2 x 12", MF: 1 x 2"; HF: 1 x 1.4"									205' / 61m														
R2-52Z	3-way; LF: 2 x 12", MF: 2 x 2"; HF: 1 x 1"									205' / 61m														
R2-52MAX	3-way; LF: 2 x 12", MF: 2 x 2"; HF: 1 x 1"																				252' / 77m			
R2-77/94/694/474**	3-way; LF: 2 x 12", MF: 1 x 2"; HF: 1 x 1"												157' / 48m											
R6-51BIAMP	3-way; LF: 6 x 12", MF: 6 x 2"; HF: 6 x 1"																					452' / 138m		
R6-51MAX	3-way; LF: 6 x 12", MF: 6 x 2"; HF: 6 x 1"																					622' / 189.6m		
R6-BASSHORN	1-way; LF: 6 x 12"																					452' / 138m		
R6-BHMAX	1-way; LF: 6 x 12"																					622' / 189.6m		
RMG-200A	1-way; MF: 1 x 2"																				240' / 73m			
R.5-V2200	1-way; MF: 2 x 2"																					315' / 96m		
RSH-462	1-way; MF: 4 x 2"																					715' / 218m		

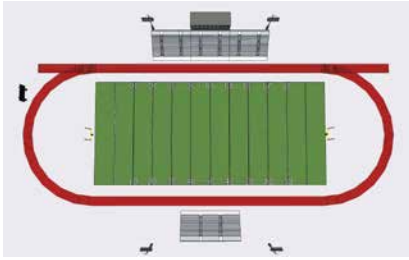
96 dB SPL with no atmospheric effects

* Voicing switch in Music position

** Average Max SPL considered or Max SPL of the lowest output device

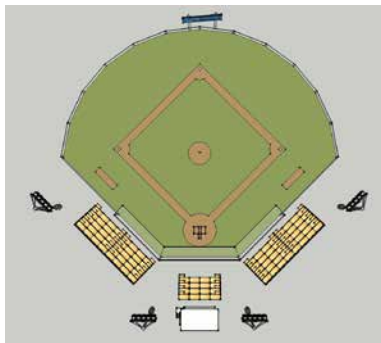
Contents

Football



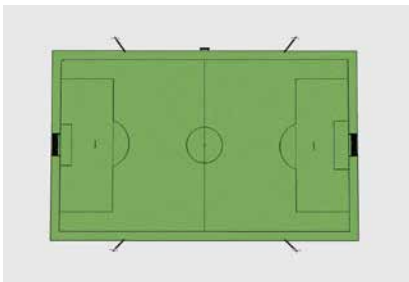
Football Field 'Press Box' Page 4
Football Field 'Lighting Poles' Page 5
Football Field 'Scoreboard' Page 6

Baseball



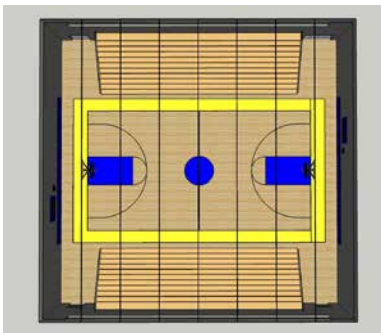
Baseball Field 'Press Box' Page 7
Baseball Field 'Lighting Poles' Page 8

Soccer



Soccer Field 'Pole Mount - Sideline Coverage' Page 9
Soccer Field 'Pole Mount - Sideline and Field' Page 10
Soccer Field 'Scoreboard' Page 11

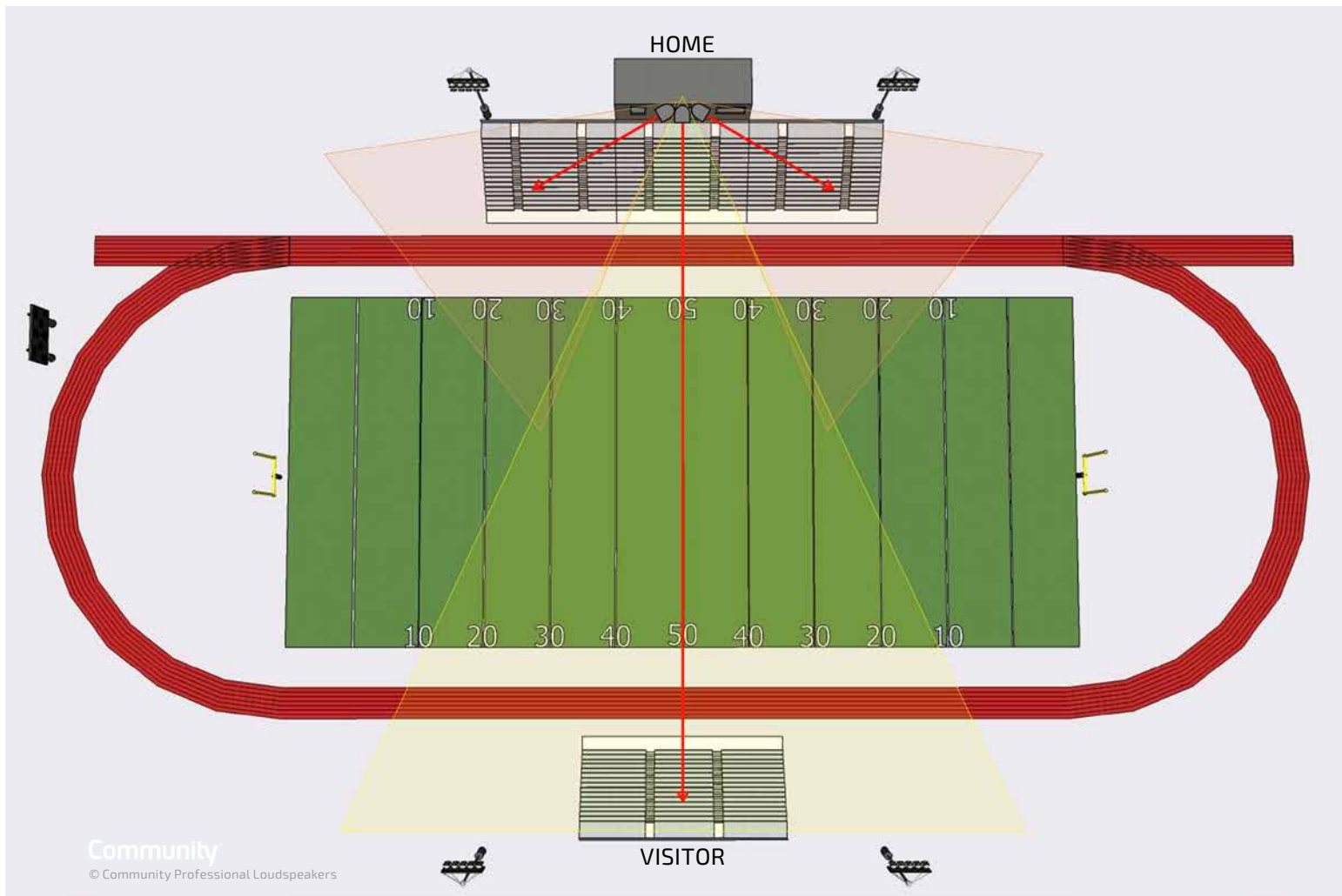
Basketball



Basketball Court 'General Coverage' Page 12
Basketball Court 'Enhanced Court Coverage' Page 13

Product Specifications Page 14
Technical Considerations Page 15

Football Field 'Press Box'



Installation Description:

The loudspeakers are mounted on the roof of a press box, preferably at least 16 feet above the highest row of seating.

The bleachers are assumed to be 20 feet tall at the back row.

An array of two to four loudspeakers to address the home seating, plus an R2-52Z or R2-52MAX in the center to provide crossfield coverage.

Option A:

One (1) R2-52MAX (*visitor coverage*)

Three (3) R.5-96MAX (*home coverage*)

High SPL and best musicality. Addresses larger bleacher areas while projecting uniformly over farther distances.

Option B:

One (1) R2-52Z (*visitor coverage*)

Two (2) R.5-94Z (*home coverage*)

Moderate SPL for use in venues with shorter bleachers (i.e., the length of the bleachers does not exceed the 30-30 yard line).

Option C:

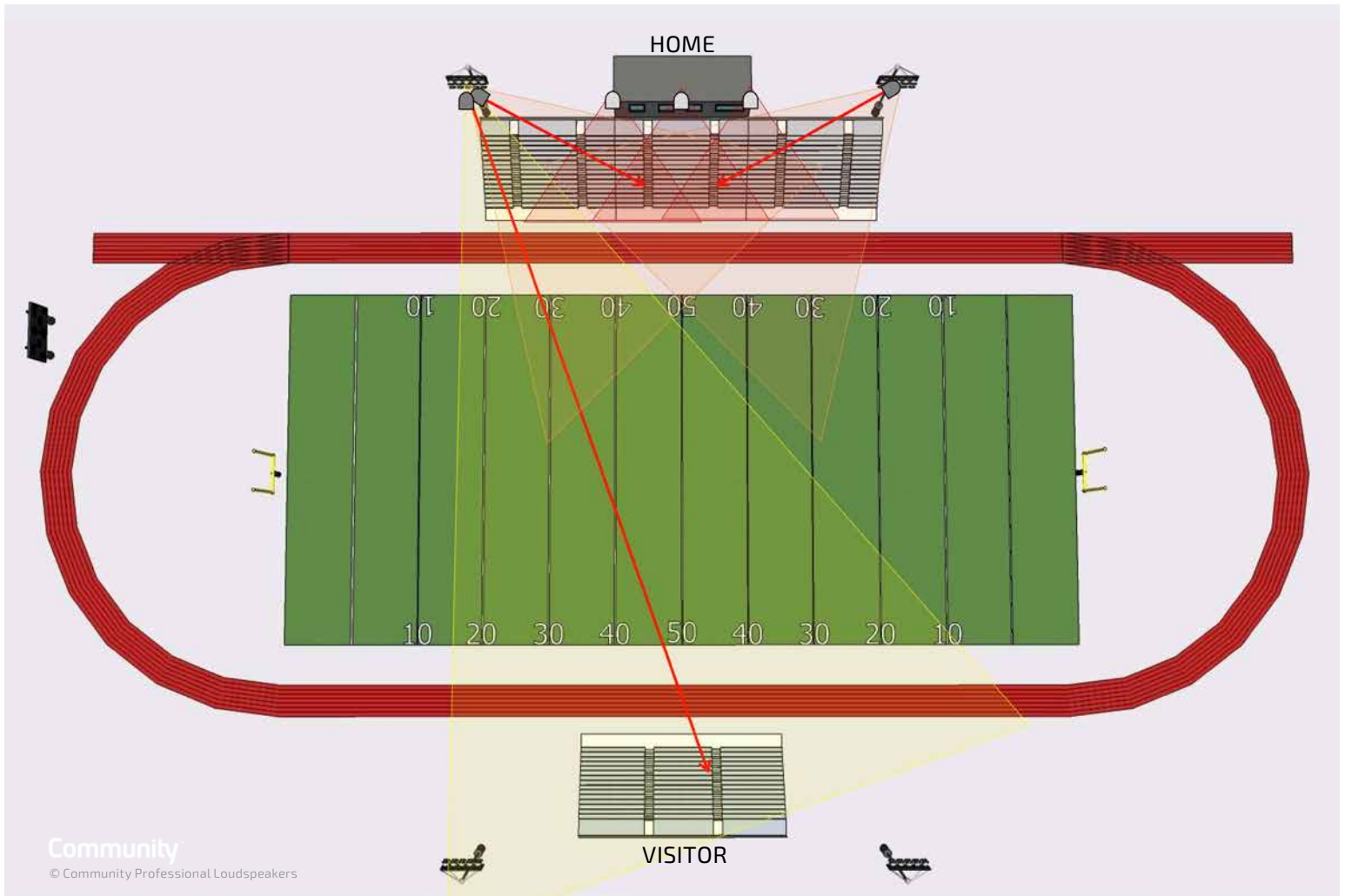
One (1) R2-52Z (*visitor coverage*)

Two (2) R2-94Z (*home coverage*)

Two (2) R.5-94Z (*center of home*)

Very articulate three-way performance and enhanced LF to the home seating section, while providing more even coverage to wide sections of the home stands.

Football Field 'Lighting Poles'



Installation Description:

The loudspeakers are pole mounted at least 25 feet above the back row.

The bleachers are assumed to be 20 feet tall.

Because the loudspeakers are mounted at a higher point, this system provides more even home seating coverage than the Football Field 'Press Box' design.

A single R2-52Z or R2-52MAX provides crossfield coverage.

Additional matching compact loudspeakers on the press box (Extra Coverage- red triangles) will help reduce artificial echoes. This can be added to either Option A or B.

Option A:

One (1) R2-52MAX (*visitor coverage*)
Two (2) R.5-96MAX (*home coverage*)

Higher SPL and enhanced musicality for venues where the light poles are up to 240 feet apart.

Option B:

One (1) R2-52Z (*visitor coverage*)
Two (2) R.5-94Z (*home coverage*)

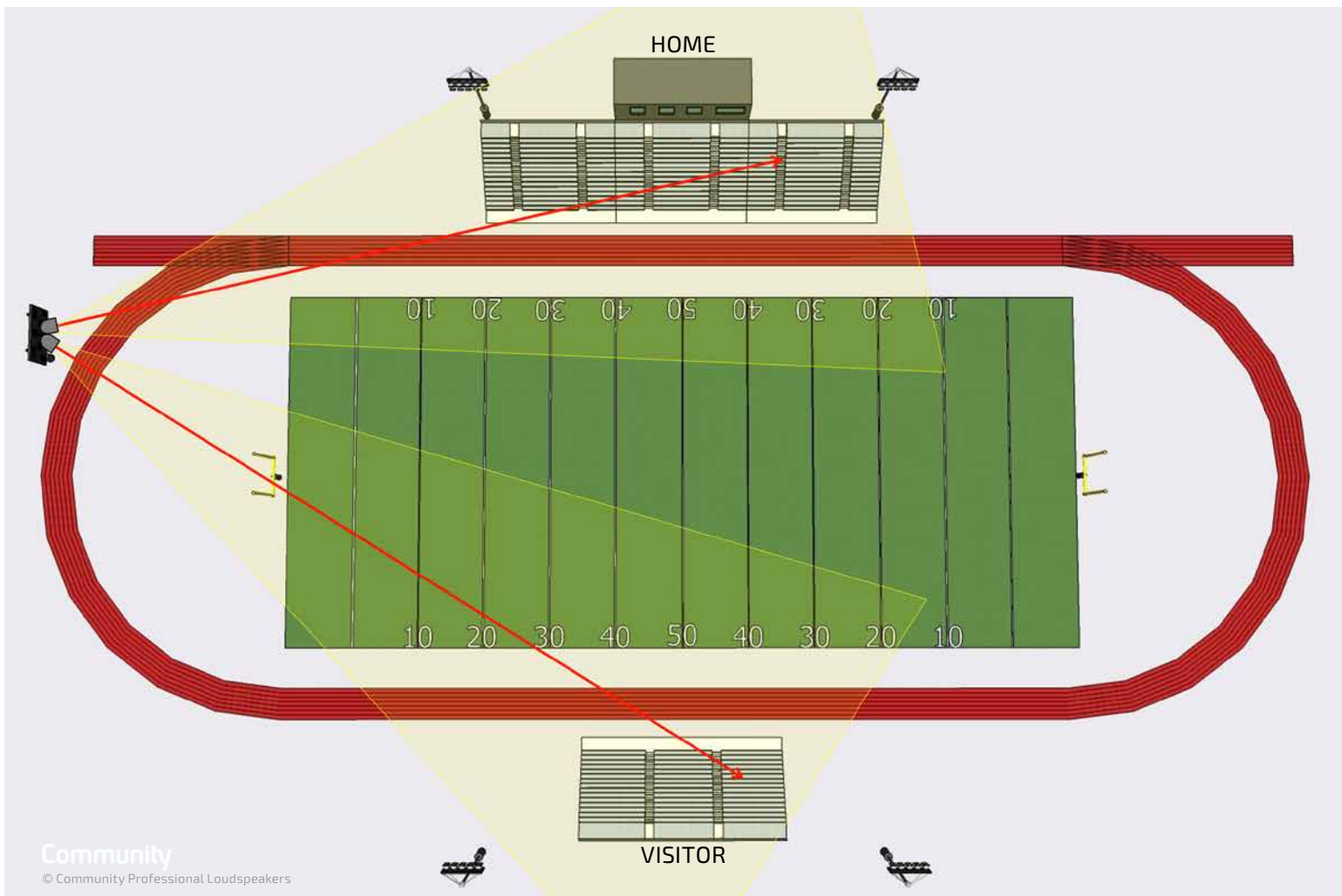
Moderate SPL for use in venues with shorter bleachers and light poles up to 180 feet apart.

Extra Coverage:

Three or Four (3-4) R.35-3896
(*additional home stands coverage*)

Additional signal-delayed coverage of the home stands helps reduce artificial echoes.

Football Field 'Scoreboard'



Installation Description:

R2-52Z or R2-52MAX loudspeakers are mounted to the scoreboard 25 feet above the ground.

The bleachers are assumed to be 20 feet tall at the back row.

Atmospheric effects such as wind, diffraction, and excess high frequency attenuation are more likely to be noticed in this design.

If the length of the home or visitor bleachers exceeds the 20-20 yard line, additional R2-52Z loudspeakers should strongly be considered for one or both sides.

Option A:

Two (2) R2-52MAX

Best coverage for shorter bleacher sections from a scoreboard location.

Option B:

Two (2) R2-52Z

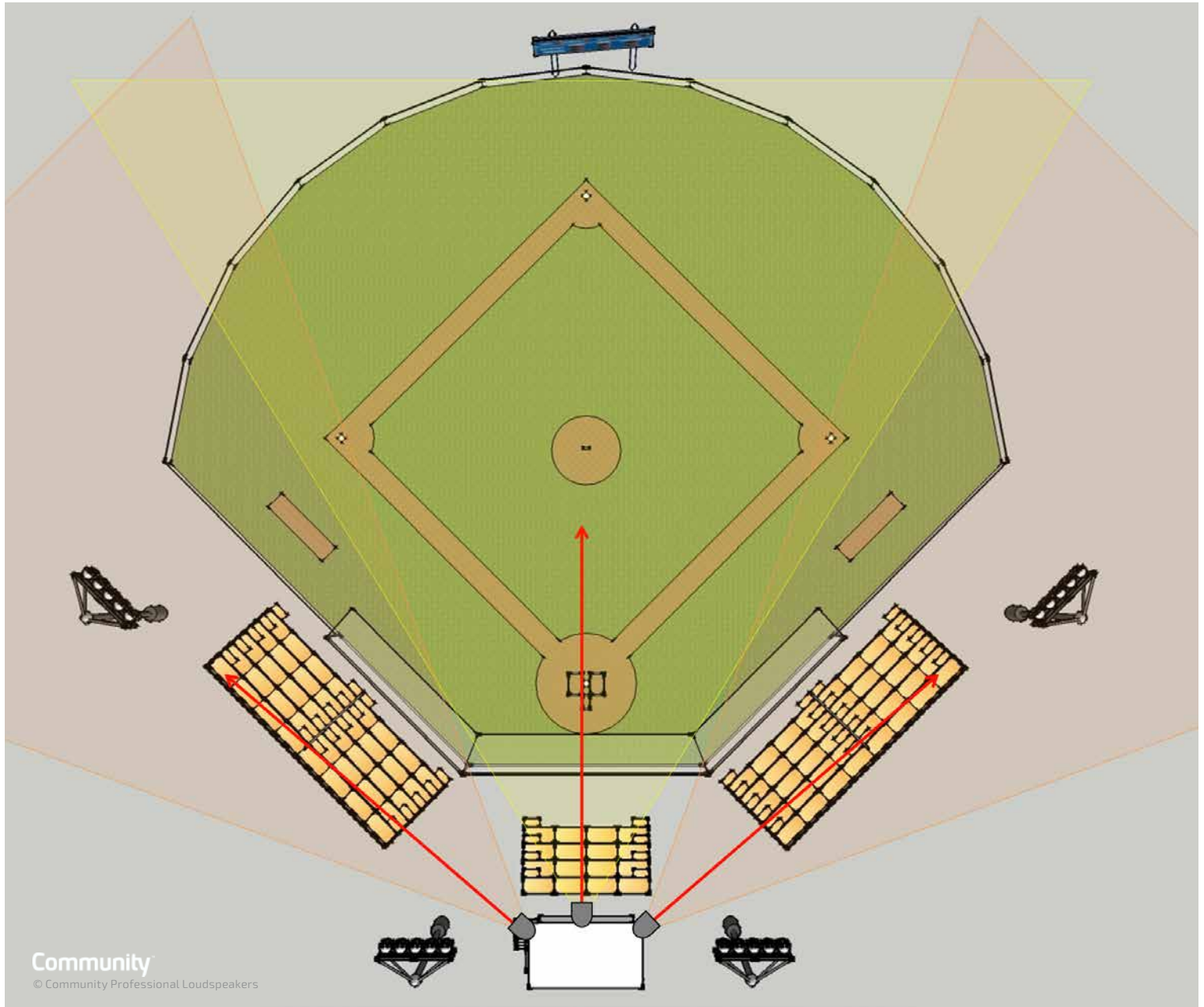
Good coverage for shorter bleacher sections from a scoreboard location.

Option C:

Three (3) or Four (4) R2-52Z

The additional R2-52Z loudspeaker(s) provides enhanced SPL at long distances or covers longer bleachers.

Baseball Field 'Press Box'



Installation Description:

Three (3) loudspeakers mounted on the top of an 18-foot tall press box.

Option A:

Three (3) R.25-94Z

Good SPL to the infield and the seating, with good speech articulation.

Option B:

Three (3) R.5-94Z

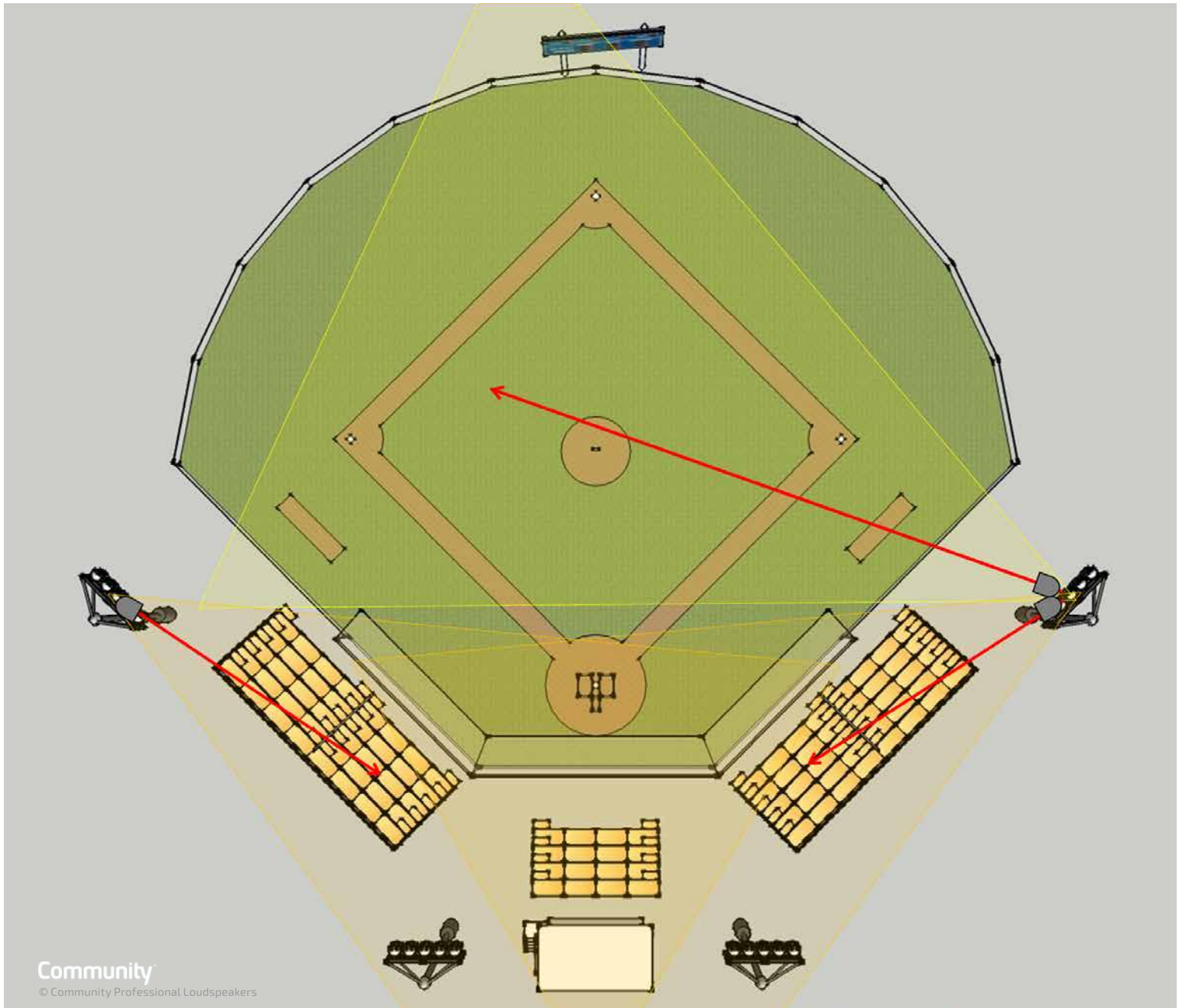
Enhanced SPL and pattern control with better bass extension. Coverage extends up to 160 feet.

Option C:

Three (3) R.5-96MAX

All of the benefits of Options A and B with greater musicality, higher SPL and the ability to address the entire field.

Baseball Field 'Lighting Poles'



Installation Description:

Three (3) loudspeakers pole mounted at a height of 30 feet, and up to 90 feet away from the press box. Additional matching compact loudspeakers on the press box (*not shown*) will help reduce artificial echoes.

Option A:

Three (3) R.35-3896

Good SPL to the infield and the seating, with good speech articulation.

Option B:

Three (3) R.5-94Z

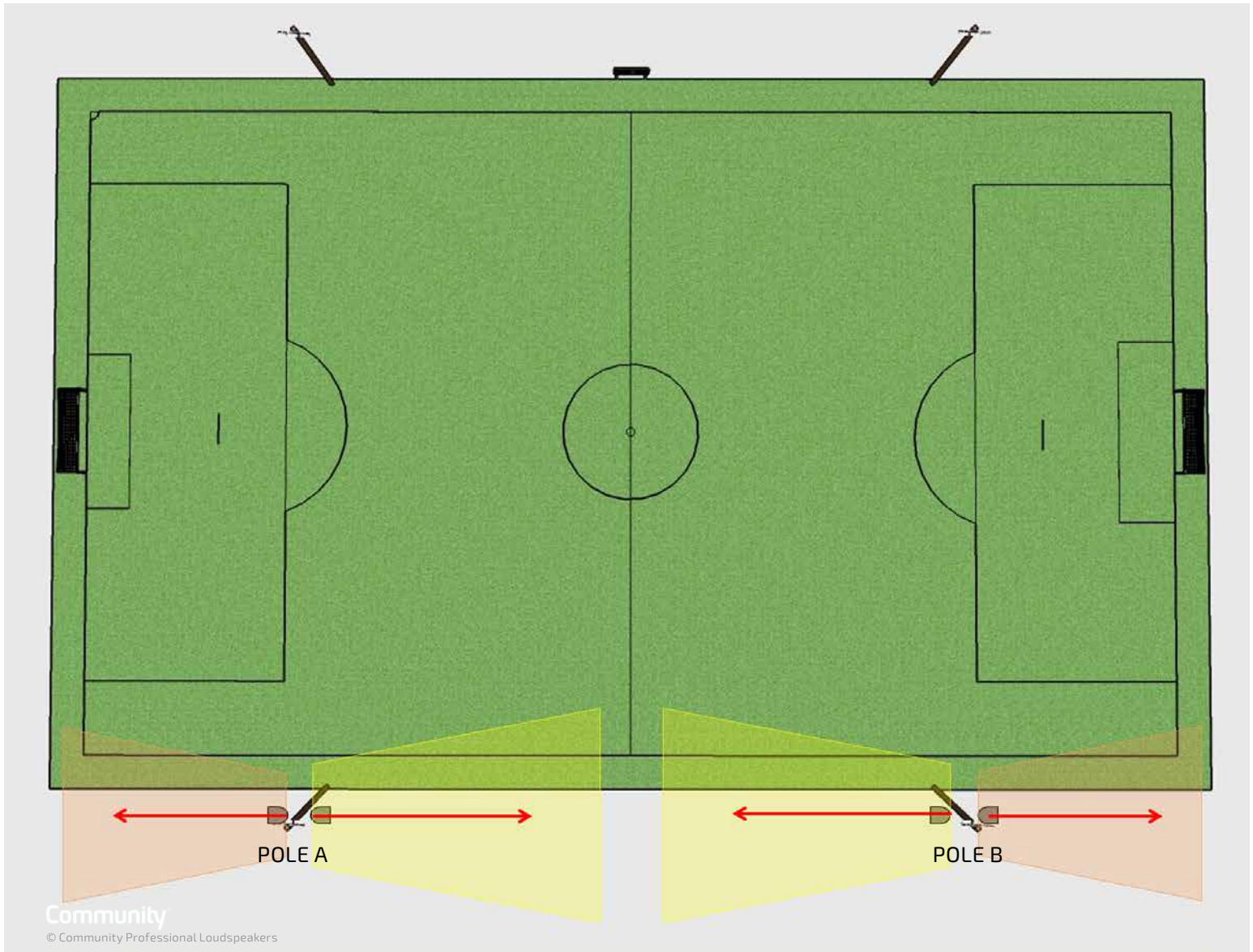
Enhanced SPL and pattern control with better bass extension.

Option C:

Three (3) R.5-96MAX

All of the benefits of Options A and B with greater musicality and higher SPL.

Soccer Field 'Pole Mount - Sideline Coverage'



Installation Description:

The loudspeakers are pole mounted 50 feet above the ground on light poles about 180 feet apart. Each loudspeaker aims down sharply to focus on an individual zone, minimizing coverage overlap. Seating may be on the ground or small bleachers.

Alternative Coverage (*two to three (2-3) loudspeakers - not shown*): If mounting heights must be low and not aimed as sharply down, use only one (1) signal-delayed loudspeaker on "Pole B" aimed away from "Pole A". Or, use a larger model on "Pole A" to address the full "Pole B" zone (no loudspeakers on "Pole B").

Option A:

Four (4) R.25-94Z

Good voice articulation and good musicality.

Option B:

Four (4) R.35-3896

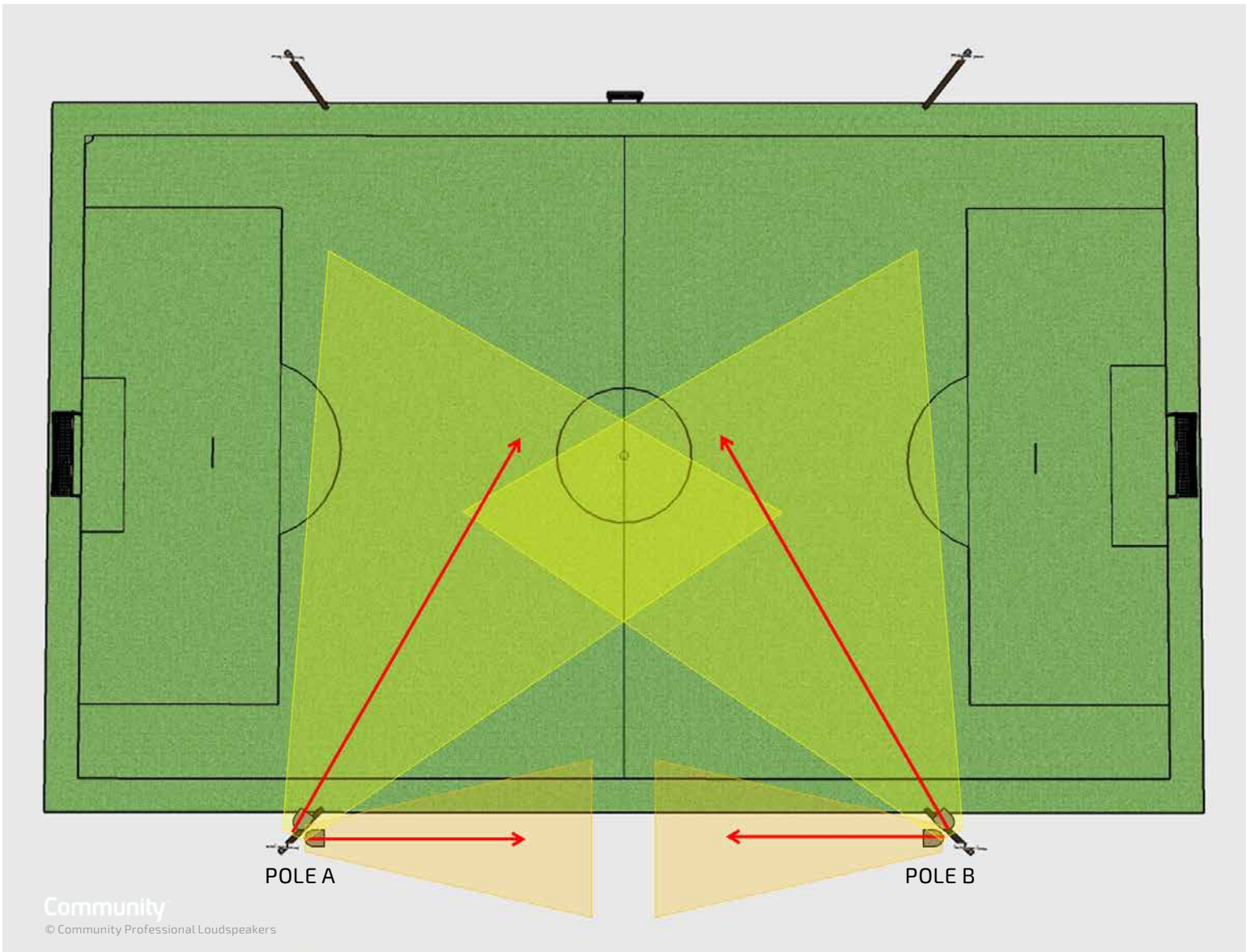
Great musicality and excellent voice articulation.

Option C:

Four (4) R.5-66Z

Very good musicality, enhanced low frequency extension and excellent voice articulation.

Soccer Field 'Pole Mount - Sideline and Field'



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Installation Description:

The loudspeakers are pole mounted at least 30 feet above the ground on light poles about 180 feet apart. Seating may be on the ground between the poles or on small bleachers.

Higher mounting points are preferred to minimize the effects of artificial echoes, ensuring good intelligibility.

Another option is using only one loudspeaker array position to cover the sideline area (as explained on page 9) to consolidate the loudspeakers on one pole.

Option A:

Two (2) R.35-3896 (*sideline coverage*)
Two (2) R.35-3896 (*field coverage*)

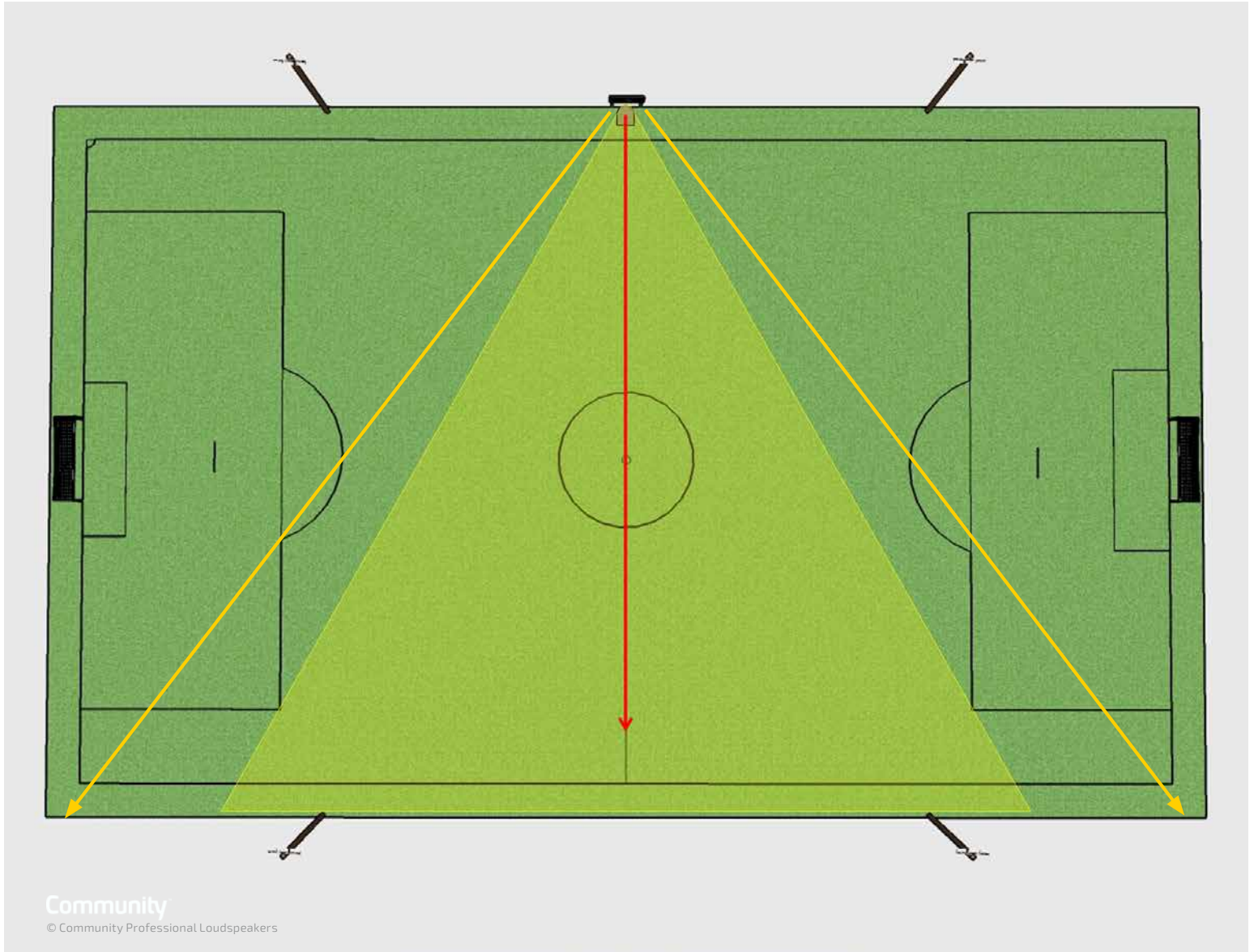
Great musicality and excellent voice articulation for the seating area and the middle of the field.

Option B:

Two (2) R.5-66Z (*sideline coverage*)
Two (2) R.5-94Z (*field coverage*)

Very good musicality, enhanced low frequency extension and excellent voice articulation for the seating area and the middle of the field.

Soccer Field 'Scoreboard'



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Installation Description:

Single or dual R2-52Z or R2-52MAX loudspeakers are mounted on the scoreboard to cover the middle of the field and the far sideline.

Option A:

One (1) R2-52Z (single cross-field red arrow; light green color coverage)

Great coverage for the viewing side and great speech intelligibility. Careful consideration should be given to the amplifier-loudspeaker wire gauge.

Option B:

Two (2) R2-52Z (two yellow arrows from the scoreboard to opposite corners of the field)

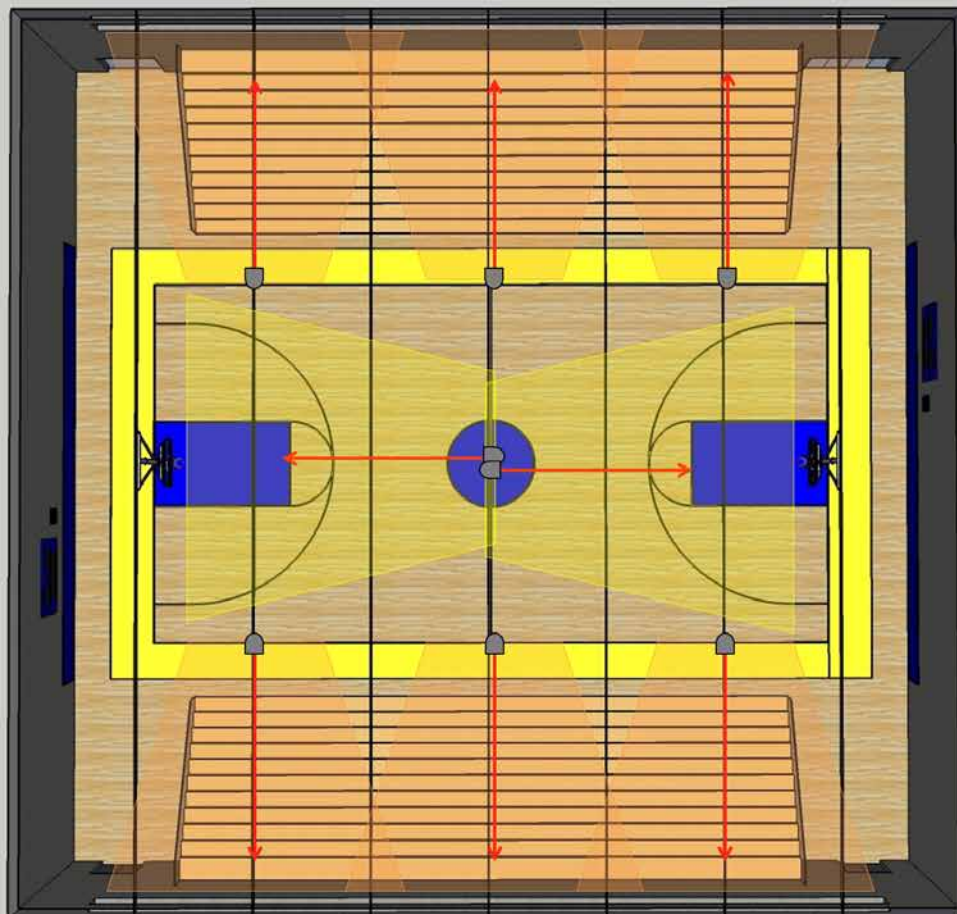
Expanded coverage providing a wider listening area along the entire sideline.

Upgrade Option:

One (1) R2-52MAX or Two (2) R2-52MAX

Substitute R2-52MAX models in either Option A or B to enhance musicality and intelligibility.

Basketball Court 'General Coverage'



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Installation Description:

A typical 120-foot by 100-foot gymnasium with a 28-foot height to the low steel (bottom of trusses).

The bleachers are up to 14 feet tall.

The bleacher loudspeakers are mounted about 20 feet in front of the first row.

Bleachers longer than 70 feet can require four (4) or more loudspeakers per side.

The court loudspeakers provide **general coverage** to the court and floor seating for sporting events.

Option A:

Six (6) R.5-94Z (*bleacher coverage*)

Two (2) R.5-99Z (*center court*)

Good pattern control (for intelligibility) and moderate SPL in non-acoustically treated spaces.

Option B:

Six (6) R.35-3896 (*bleacher coverage*)

Two (2) R.35-3896 (*center court*)

Less low frequency extension, but excellent voice clarity with moderate SPL.

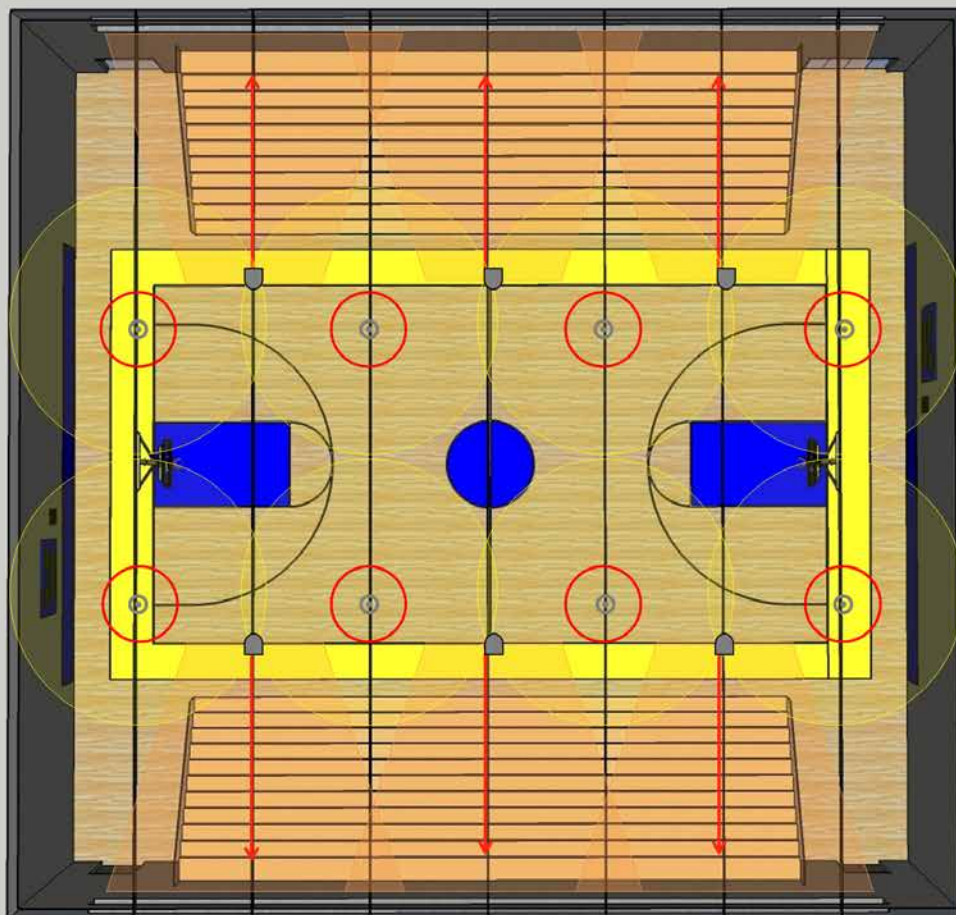
Option C:

Six (6) R.5-96MAX (*bleacher coverage*)

Two (2) R.5-99Z (*center court*)

Increased musicality, high SPL, and great pattern control. Subwoofers are often added to this system configuration.

Basketball Court 'Enhanced Court Coverage'



Community

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Installation Description:

A typical 120-foot by 100-foot gymnasium with a 28-foot height to the low steel (bottom of trusses).

The bleachers are up to 14 feet tall.

The bleacher loudspeakers are mounted about 20 feet in front of the first row.

Bleachers longer than 70 feet can require four (4) or more loudspeakers per side.

The court loudspeakers provide **enhanced coverage** to the court for higher speech intelligibility and allow more zone control to accommodate multi-purpose events.

Option A:

Six (6) R.5-94Z (bleacher coverage)

Eight (8) R.25-94Z (court coverage)

Good pattern control and moderate SPL in non-acoustically treated spaces for the bleachers, court and floor seating.

Option B:

Six (6) R.35-3896 (bleacher coverage)

Eight (8) R.35COAX (court coverage)

Less low frequency extension, but excellent voice clarity with moderate SPL for all areas.

Option C:

Six (6) R.5-96MAX (bleacher coverage)

Eight (8) R.5-99Z (court coverage)

Increased musicality, high SPL, and great pattern control across all listening areas.

Product Specifications

For loudspeakers referenced in this guide

R.25-94Z (R.25-94TZ)



Transducers: LF - 1 x 8"; HF - 1 x 0.75" exit compression driver
Operating Range: 100 Hz – 16 kHz
Sensitivity (1W/1m): 97 dB (96 dB)
Power Handling: 200W continuous @ 8 ohms (Various)
Continuous Max Output: 120 dB (126 dB Peak)
Nominal Beamwidth (H x V): 90° x 40°
Dimensions (H x W x D): 11.3 x 11.3 x 13.3 in. (287 x 287 x 338 mm)

R.35COAX



Transducers: LF - 1 x 10"; coaxial HF - 1 x 1.25" exit compression driver
Operating Range: 70 Hz – 16 kHz
Sensitivity (1W/1m): 97 dB
Power Handling: 200W continuous @ 8 ohms, or 70V/100V Autoformer
Continuous Max Output: 122 dB (128 dB Peak)
Nominal Beamwidth (H x V): 90° x 90° (conical)
Dimensions (H x W x D): 11 x 13 x 13.5 in. (279 x 330 x 343 mm)

R.35-3896



Transducers: LF - 1 x 8"; coaxial MF - 2 x 2.35" and HF - 1 x 1" exit comp. driver
Operating Range: 80 Hz – 16 kHz
Sensitivity (1W/1m): 100 dB
Power Handling: 400W continuous @ 8 ohms, or 70V/100V Autoformer
Continuous Max Output: 126 dB (132 dB Peak)
Nominal Beamwidth (H x V): 90° x 60°
Dimensions (H x W x D): 11 x 13 x 13.5 in. (279 x 330 x 343 mm)

R.5-66Z (R.5-66TZ)

R.5-94Z (R.5-94TZ)

R.5-99Z (R.5-99TZ)



Transducers: LF - 1 x 12"; HF - 1 x 1" exit compression driver
Operating Range: 85 Hz – 16 kHz
Sensitivity (1W/1m): 102 dB - 103 dB (101 dB - 102 dB)
Power Handling: 200W continuous @ 8 ohms (Various)
Continuous Max Output: 126 dB (132 dB Peak)
Nominal Beamwidth (H x V): -66Z (60° x 60°), -94Z (90° x 40°), -99Z (90° x 90°)
Dimensions (H x W x D): 16 x 16 x 16 in. (406 x 406 x 406 mm)

R.5-96MAX



Transducers: LF - 1 x 12"; coaxial HF - 1 x 1.4" exit compression driver
Operating Range: 70 Hz – 20 kHz
Sensitivity (1W/1m): 103 dB
Power Handling: 600W continuous @ 8 ohms
Continuous Max Output: 130 dB (136 dB Peak)
Nominal Beamwidth (H x V): 90° x 60° (Additional horn patterns available)
Dimensions (H x W x D): 16.0 x 16.0 x 16.2 in. (406 x 406 x 411 mm)

R2-94Z



Transducers: LF - 2 x 12"; MF - 1 x 2" exit M200 driver; HF - 1 x 1" exit comp. driver
Operating Range: 70 Hz – 16 kHz
Sensitivity (1W/1m): 105 dB
Power Handling: 400W continuous @ 4 ohms
Continuous Max Output: 131 dB (137 dB Peak)
Nominal Beamwidth (H x V): 90° x 40° (Additional horn patterns available)
Dimensions (H x W x D): 24.75 x 24.75 x 29 in. (629 x 629 x 737 mm)

R2-52Z



Transducers: LF - 2 x 12"; MF - 2 x 2" exit M200 driver; HF - 1 x 1" exit comp. driver
Operating Range: 70 Hz – 16 kHz
Sensitivity (1W/1m): 107 dB
Power Handling: 400W continuous @ 4 ohms
Continuous Max Output: 133 dB (139 dB Peak)
Nominal Beamwidth (H x V): 50° x 20°
Dimensions (H x W x D): 24.75 x 24.75 x 29 in. (629 x 629 x 737 mm)

R2-52MAX



Transducers: LF - 2 x 12"; MF - 2 x 2" exit M200HP driver; HF - 1 x 1" exit comp. driver
Operating Range: 71 Hz – 19.5 kHz
Sensitivity (1W/1m): LF: 102 dB, HF/MF: 110 dB
Power Handling: LF: 1200W cont. @ 8 ohms, HF/MF: 350W cont. @ 8 ohms
Continuous Max Output: 135 dB (141 dB Peak)
Nominal Beamwidth (H x V): 50° x 20°
Dimensions (H x W x D): 24.75 x 24.75 x 29 in. (629 x 629 x 737 mm)

Full specifications for these, and other models, are available at www.communitypro.com.

Loudspeaker data files are available for EASE and EASE Focus acoustic modeling software to facilitate optimum system design. (EASE and EASE Focus are products of AFMG Technologies GmbH.)

Technical Considerations

Amplifier

For maximum system performance and longevity, the loudspeakers must be properly powered to achieve the needed sound pressure level (SPL) in the listening area.

Model	Power Recommendation
R.25-94Z	400W to 600W @ 8 ohms per loudspeaker
R.35COAX	400W to 600W @ 8 ohms per loudspeaker
R.35-3896	800W to 1200W at 8 ohms per loudspeaker
R.5-66Z	400W to 600W @ 8 ohms per loudspeaker
R.5-94Z	400W to 600W @ 8 ohms per loudspeaker
R.5-99Z	400W to 600W @ 8 ohms per loudspeaker
R.5-96MAX	1200W to 1800W at 8 ohms per loudspeaker
R2-94Z	800W to 1200W at 4 ohms per loudspeaker
R2-52Z	800W to 1200W at 4 ohms per loudspeaker
R2-52MAX	1200W to 2400W at 8 ohms per loudspeaker

Processing and Protection

To properly process, equalize and protect the loudspeaker systems, it is recommended to use the Community **dSPEC226** digital signal processor.

Some amplifiers have built-in processing which may be adequate when properly programmed. Community's suggested DSP settings can be found at www.communitypro.com.

All of the loudspeakers referenced in this guide require a 24 dB per Octave electronic high pass filter for protection against over-excursion from bass-heavy program material.

Wiring

When considering the distance between the amplifier and the loudspeaker(s), the following minimum cable gauges are suggested.

Distance between the Amplifier and Loudspeaker(s)	Suggested Minimum Cable Gauge
Less than 50 feet	14 AWG
50 to 100 feet	12 AWG
100 to 250 feet	10 AWG
Beyond 250 feet	Please contact the Community TAG Team

It is strongly recommended that all loudspeaker level wire be stranded, twisted and never shielded. Loudspeaker wires should not be connected to earth ground or supporting structures.

For technical and applications assistance, please contact the Community TAG Team (Technical Applications Group) at (610) 876-3400 or tagteam@communitypro.com.



Community Professional Loudspeakers is a developer and manufacturer of innovative loudspeaker systems for installed sound applications.

Community products elevate the listening experience at the world's foremost indoor and outdoor sports venues, auditoria, theme parks, worship facilities and convention centers.

For applications that demand reliable, long-term performance and consistent, high-quality sound – often in extreme and challenging environments – Community loudspeakers provide the critical listening experience audiences deserve and facility managers demand.

Based in Chester, Pennsylvania, Community is an American original whose innovative products have shaped the professional sound industry since the company was founded in 1968.

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