

# TOC™

T I M E O F F S E T C O R R E C T I O N



PROFESSIONAL AUDIO SYSTEMS

**T H E N E X T P H A S E I N**

## TOC™ SYSTEMS GROUP

Sound reinforcement systems have evolved to a new level of performance.

The need for higher definition, consistent sound energy throughout the audience, and higher spl with increased bandwidth has provided the loudspeaker designer a formidable challenge.

PAS has met this challenge head on with the development of the TOC™ SYSTEMS GROUP. The physics of sound waves define the design parameters to meet the challenge.

PAS Engineers have exercised their talents by dovetailing scientific acoustical design and artistic license. Our commitment was to insure that the following design parameters were addressed in each TOC™ product:

- *Time Offset Correction delay and equalization remove the effects of the individual driver's phase response. The system's phase response becomes that of the dividing filters. This "ideal phase response" is a characteristic of all TOC™ models.*
- *Maximize SPL by pioneering concentric loudspeaker technology and strict attention to enclosure design.*
- *Extend Bandwidth through precision equalization without sacrificing power handling or phase linearity.*
- *Insure Acoustical Compatibility when arraying multiple enclosures.*

By maintaining this design theme, TOC™ Systems Group offers the widest range of performance products to the sound reinforcement professional.

The Sound Installer and Live Sound Engineer are assured that all TOC™ products will provide the best value for the application. Not creating value at the expense of performance, but defining value as the Highest Performance at All Price Points.

When choosing the VM-1 for on stage vocal monitoring, the RS-2.2 for full range reinforcement in a single enclosure, or the LT-2 with pinpoint pattern control for greater distant throw, you are insured of these features:

- *Compact Design. The use of concentric loudspeaker design, eliminates the space required for horn and woofer components, resulting in a dramatic reduction in space requirements for installation and portability.*
- *Feedback Rejection. The combination of superior dividing networks, Time Offset Correction and the point source relationship of a concentric loudspeaker maximizes gain before feedback and significantly reduces the need for equalization.*
- *Variable High Frequency Pattern Control. The concentric loudspeaker may be rotated 360 degrees within the enclosure. This allows the system to be installed in the appropriate position and the horn to be focused on the desired location.*
- *Ease of Installation and Set-Up. By virtue of their compactness, variable pattern control, feedback rejection, reduced need for equalization, and fly ready design, TOC™ Systems Group is unparalleled for ease in installation and set-up.*

### Finish Options and Handles

All of the TOC™ Systems Group are constructed of 15mm Baltic birch plywood except for the CB-2 which is 19mm. The finishes available are:

- **Black Texture:** An environmentally safe water-based acrylic. The standard finish for installations.
- **Charcoal Carpet:** More resistant to abrasions and rough handling, this is often the choice of rental and touring companies.
- **Sanded and filled:** For installations that require matching of the cabinet finish with the decor of the site. Without handles.
- **White Texture:** Water-based acrylic used for installations. Without handles.
- **Weather Resistant:** Black polyurethane coating. Impervious to water and U.V. Without handles.

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# LOUDSPEAKER™

T E C H N O L O G Y

*RS -1*

*RS -1.2*

*RS -2.2*



**RS-1**, The reason the RS-1 has been the most popular installation loudspeaker manufactured by PAS is clear: high definition in a compact package, extended bandwidth and ease of installation.

Concentric speaker design, precision crossover filters and dual 15 inch long excursion woofers create a one box extended loudspeaker that is unsurpassed in vocal reinforcement and music playback. The RS-1 features:

- Concentric 15" loudspeaker.
- Extended high frequency 1" compression driver.
- Supplementary 15" woofer for extended low frequencies.
- Passive dividing network with Time Offset Correction (TOC™) and equalization.
- Baltic birch cabinet construction.
- Foam backed steel grille.
- Recessed handles.
- Fly hardware (anchor plate or optional truss array w/steel reinforcement).
- Compact enclosure for ease in installation.

#### **RS-1 Specifications:**

*Frequency Response: 40 to 16kHz*

*Power Rating: \*600 watts*

*Nominal Impedance: 4 ohm*

*Sensitivity (1w/1m): 99 dB*

*Maximum SPL: 127 dB @1meter  
(@ rated power)*

*Nominal Coverage Angles:  
60°H x 40° V, above 2 kHz*

*Crossover Frequency: 1.2 kHz*

*L.F. Drivers: CXL-1580C &  
HL-1580C*

*H.F. Driver: DE 45/8*

*Input Connectors: 2 x NL4*

*Dimensions:*

*35.35" H x 17.25"W x 24"D*

*Weight: 116 lbs*

**RS-1.2**, Since it's introduction in early 1996, the RS-1.2 has become the most popular system in the TOC™ line. The RS-1.2 uses a 2 inch compression driver. The higher sensitivity and greater power handling of this driver results in 9 dB more high frequency headroom than systems with 1 inch drivers. The results are increased clarity, intelligibility and greater throw.

A precision passive dividing network and single amplifier connection allows for ease of installation.

The RS-1.2 features are similar to the RS-1 with these differences:

- Concentric 4" voice coil 15" loud speaker.
- Extended high frequency 2" compression driver.
- Supplementary 4" voice coil 15" woofer for extended low frequencies.

#### **RS-1.2 Specifications:**

*Frequency Response: 40 to 16kHz*

*Power Rating: \*800 watts*

*Nominal Impedance: 4 ohm*

*Sensitivity (1w/1m): 100 dB*

*Maximum SPL: 128 dB @1meter  
(@ rated power)*

*Nominal Coverage Angles:  
60° H x 40° V, above 2 kHz*

*Crossover Frequency: 1.2 kHz*

*L.F. Drivers: CXL-2580C &  
HL-2580C*

*H.F. Driver: DE 750/8*

*Input Connectors: 2 x NL4*

*Dimensions:*

*35.35" H x 17.25"W x 24"D*

*Weight: 128 lbs*

**RS-2.2**, When maximum reliability and SPL is required, the RS-2.2 is the choice. Used with the TOC™ R2 processor, the RS-2.2 contains the same components as the RS-1.2 (minus the passive network) and gets the greatest performance out of them.

The TOC™ R2 processor contains: four pole linear phase dividing filters, precise equalization, Time Offset Correction (TOC™) and limiters.

The RS-2.2 features are similar to the RS-1.2 with this difference:

- Contains no passive dividing network since the system is intended to be biamplified.

#### **RS-2.2 Specifications:**

*Frequency Response: 40 to 16kHz*

*Power Rating: \*1000 watts*

*HF: 100 watts*

*Nominal Impedance: 4 ohm*

*HF: 8 ohms*

*Sensitivity (1w/1m): 100 dB*

*Maximum SPL: 129 dB @1meter  
(@ rated power)*

*Nominal Coverage Angles:*

*60° H x 40° V, above 2 kHz*

*Crossover Frequency: 1.2 kHz*

*L.F. Drivers: CXL-2580C &  
HL-2580C*

*H.F. Driver: DE 750/8*

*Input Connectors: 2 x NL4*

*Dimensions:*

*35.35" H x 17.25"W x 24"D*

*Weight: 124 lbs*

#### **Subwoofers**

The TOC™ subwoofers CB-2 or RS-2BB can be used to supplement and extend the low frequencies of these cabinets.

*Due to limitations of the passive dividing networks the long term average power rating of the concentric section is limited to 200 watts (40 volts into 8 ohms). Since the RS-1 and RS-1.2 have a supplemental 15" driver, their nominal impedance is 4 ohms. The long term average power rating of these cabinets is 400 watts (40 volts into 4 ohms). This in no way affects their transient capabilities. PAS recommends amplifiers that produce at least twice this power (800 watts into 4 ohms) for these cabinets. Since the RS-2.2 does not contain a dividing network, it does not have this limitation.*



***FT-1***

***FT-1.2***

***FT-2.2***



**FT-1**, Designed as a compact full range trapezoid reinforcement system where subwoofers are used for low frequency support.

Concentric speaker design, precision dividing filters provides intelligible vocal reinforcement and high definition music playback. The FT-1 is an excellent choice for compact flying arrays or a supplementary front or sidefill system in RS-1 or RS-1.2 arrays. The FT-1 features:

- Concentric 15" loudspeaker.
- Extended high frequency 1" compression driver.
- Passive dividing network with Time Offset Correction (TOC™) and equalization.
- Baltic birch cabinet construction.
- Foam backed steel grille.
- Recessed handles.
- Fly hardware (anchor plate or optional truss array w/steel reinforcement).
- Pole mount.
- Compact enclosure design for ease in installation.

#### **FT-1 Specifications:**

*Frequency Response: 50 to 16kHz*

*Power Rating: \*300 watts*

*Nominal Impedance: 8 ohm*

*Sensitivity (1w/1m): 99 dB*

*Maximum SPL: 124 dB @1 meter  
(@ rated power)*

*Nominal Coverage Angles:  
60° H x 40° V, above 2 kHz*

*Crossover Frequency: 1.2 kHz*

*L.F. Driver: CXL-1580C*

*H.F. Driver: DE 45/8*

*Input Connectors: 2 x NL4*

*Dimensions:*

*21.25" H x 17.25" W x 17" D*

*Weight: 66 lbs*

**FT-1.2**, Using the same physical package as the FT-1, the FT-1.2 uses a 2 inch compression driver. The higher sensitivity and greater power handling of this driver results in 9 dB more high frequency headroom than systems with 1 inch drivers. The results are increased clarity, intelligibility and greater throw.

A precision passive dividing network and single amplifier connection allows for ease of installation.

The FT-1.2 features are similar to the FT-1 with these differences:

- Concentric 4" voice coil 15" loudspeaker
- Extended high frequency 2" compression driver

#### **FT-1.2 Specifications:**

*Frequency Response: 50 to 16kHz*

*Power Rating: \*400 watts*

*Nominal Impedance: 8 ohm*

*Sensitivity (1w/1m): 100 dB*

*Maximum SPL: 125 dB @1 meter  
(@ rated power)*

*Nominal Coverage Angles:*

*60° H x 40° V, above 2 kHz*

*Crossover Frequency: 1.2 kHz*

*L.F. Driver: CXL-2580C*

*H.F. Driver: DE 750/8*

*Input Connectors: 2 x NL4*

*Dimensions:*

*21.25" H x 17.25" W x 17" D*

*Weight: 76 lbs*

**FT-2.2**, When maximum reliability and SPL is required, the FT-2.2 is the choice. Used with the TOC™ S2 processor, the FT-2.2 contains the same components as the FT-1.2 (minus the passive network) and gets the greatest performance out of them.

The TOC™ S2 processor contains: four pole linear phase dividing filters, precise equalization, Time Offset Correction (TOC™) and limiters.

The FT-2.2 features are similar to the FT-1.2 with this difference:

- Contains no passive dividing network since the system is intended to be biamplified.

#### **FT-2.2 Specifications:**

*Frequency Response: 50 to 16kHz*

*Power Rating: LF: \*500 watts*

*HF: 100 watts*

*Nominal Impedance: LF: 8 ohm*

*HF: 8 ohms*

*Sensitivity (1w/1m): 100 dB*

*Maximum SPL: 126 dB @1 meter  
(@ rated power)*

*Nominal Coverage Angles:*

*60° H x 40° V, above 2 kHz*

*Crossover Frequency: 1.2 kHz*

*L.F. Driver: CXL-2580C*

*H.F. Driver: DE 750/8*

*Input Connectors: 2 x NL4*

*Dimensions:*

*21.25" H x 17.25" W x 17" D*

*Weight: 72 lbs*

#### **Subwoofers**

When these systems are used for full range music reinforcement or playback, the TOC™ subwoofers CB-2, RS-2BB or EB-1 are recommended.

*Due to limitations of the passive dividing networks the long term average power rating of the FT-1 and FT-1.2 is limited to 200 watts (40 volts into 8 ohms). This in no way affects their transient capabilities. PAS recommends amplifiers that produce at least twice this power (400 watts into 8 ohms) for these cabinets. Since the FT-2.2 does not contain a dividing network, it does not have this limitation.*



*LT-2*



*BH-2*



## TOC™ SYSTEMS GROUP LONG THROW SOLUTION

Most live sound systems lack long throw capability. The TOC™ solution provides a full range long throw package or the option of adding long throw to an existing system.

In the development of the LT-2 and BH-2, PAS engineers accepted two challenges to provide the most versatile long throw solution to our customers:

**The First Challenge** of voice and music support for large facilities is reaching the people at 75 to 100 yards and more with presence and intelligibility.

**The Second** is doing this without overpowering those in front or bothering the ones a mile away.

There are few products that successfully meet the first challenge. There are even fewer that meet the second.

Two products in the TOC™ systems group provide a unique answer to these challenges:

**LT-2.** This long throw mid/high cabinet has the very high Q necessary to project these distances in the range from 200 Hz to 10 kHz and beyond. It is a concentric design that contains a 12 inch coaxial loudspeaker with a 2 inch compression driver precisely loaded into a trapezoidal concentric horn assembly.

The LT-2 features:

- A concentric 4" voice coil 12 inch loudspeaker with kevlar reinforced diaphragm.
- An Extended high frequency 2" compression driver.
- Fiberglass reinforce low frequency horn with concentrically mounted high frequency horn.
- Baltic birch cabinet with an environmentally safe water-based black acrylic finish. A weather resistant black polyurethane coating is available for outdoor installations (on special order).
- BH-2s are recommended for full range systems. CB-2 subwoofers can be used for supplemental response below 80Hz

## LT-2 CONCENTRIC HORN.

Unique to TOC™ Systems Group, the concentric design sets a standard in long throw technology above that of the competition.

With an acoustical center that remains constant throughout its entire frequency range, the LT-2 has a seamless transition between the mid and high frequencies.

The LT-2's acoustical center is located three inches inside the rear of the cabinet. The apparent apexes of both horn sections are in the same location. When arraying multiple LT-2s for wider coverage, having these points in the same location greatly reduces the acoustical interference known as lobing.

**BH-2.** This bass horn uses a pair of 12" bass drivers in a 60 Hz vented horn. It is used to provide low frequency support in the octave and a half below 200 Hz. This is the range of most of the power in music and voice. It is also the range in which directional control becomes difficult due to the wavelengths involved. Multiple BH-2s in arrays make possible directional control that makes both challenges a reality. A minimum of two cabinets is necessary for this performance. Venting the rear chamber not only smooths the response near the cutoff frequency, it also provides an efficient means of cooling these high powered drivers.

**Compatibility.** Identical size, balance points and acoustic centers make the LT-2 and BH-2 cabinets easily combined in arrays.

The TOC™ L2 processor is required for rated performance.

### LT-2 Specifications:

*Frequency Response: 200 to 16kHz*

*Power Rating: LF \*500 watts  
HF 100 watts*

*Nominal Impedance: LF: 8 ohms  
HF: 8 ohms*

*Sensitivity (1w/1m): LF: 112 dB  
HF: 120 dB*

*Maximum SPL: 139dB @ 1 meter  
(@ rated power)*

*Nominal Coverage Angles: 20° H x 30° V*

*Crossover Frequency: 1.2 kHz*

*L.F. Driver: CX-2280C*

*H.F. Driver: DE 750/8*

*Input Connectors: 1 x NL4*

*Dimensions: 36" H x 26" W x 42" D*

*Weight: 185 lbs*

### BH-2 Specifications:

*Frequency Response: 80 - 200Hz*

*Power Rating 1000 Watts*

*Nominal Impedance: 4 ohms*

*Sensitivity (1w/1m): 109 dB*

*Maximum SPL: 139dB @ 1 meter  
(@ rated power)*

*Nominal Coverage Angles:*

*Configuration Dependent*

*One cabinet: 120° H x 100° V*

*Drivers: BH-2280C x 2*

*Input Connectors: 1 x NL4*

*Dimensions: 36" H x 26W x 42" D*

*Weight: 185lbs*



*SW-1*

*SW-1.2*

*SW-2.2*



**SW-1**, This 15 inch concentric design is a superior foldback monitor. Since the SW-1 does not contain a separate high frequency device, it has a smaller footprint and lower profile. The result is a very compact stage monitor.

Concentric speaker design combined with the ideal phase response produced by Time Offset Correction (TOC™) and equalization makes the SW-1 a high definition monitor and allows much higher gain before feedback.

The SW-1 features:

- Concentric 15" loudspeaker.
- Extended high frequency 1" compression driver.
- Passive dividing network with Time Offset Correction (TOC™) and equalization.
- Baltic birch cabinet construction.
- Foam backed steel grille.
- Recessed handles.
- Pole mount.
- Compact enclosure for improved sight lines.

#### **SW-1 Specifications:**

*Frequency Response: 55 to 16kHz*  
*Power Rating: \*300 watts*  
*Nominal Impedance: 8 ohms*  
*Sensitivity (1w/1m): 99 dB*  
*Maximum SPL: 124 dB @ 1meter*  
*(@ rated power)*  
*Nominal Coverage Angles:*  
*40° H x 60° V, above 2 kHz*  
*Crossover Frequency: 1.2 kHz*  
*L.F. Driver: CX-1580C*  
*H.F. Driver: DE 45/8*  
*Input Connectors: 2 x NL4*  
*Dimensions:*  
*21.25" H x 17.25" W x 15.25" D*  
*Weight: 57 lbs*

**SW-1.2**, The SW-1.2 uses a 2 inch compression driver. The higher sensitivity and greater power handling of this driver results in 9 dB more high frequency headroom than systems with 1 inch drivers. This combined with much higher gain before feedback that ideal phase response produces have made the SW-1.2 our most popular stage monitor.

The precision passive dividing network with TOC™ and equalization reduce the need for additional equalizers. This can result in considerable savings where equipment budgets are limited.

The SW-1.2 features are similar to SW-1 with these differences.

- Concentric 4" voice coil 15" loud speaker.
- Extended high frequency 2" compression driver.

#### **SW-1.2 Specifications:**

*Frequency Response: 55 to 16kHz*  
*Power Rating: \*400 watts*  
*Nominal Impedance: 8 ohm*  
*Sensitivity (1w/1m): 100 db*  
*Maximum SPL: 125 dB @ 1meter*  
*(@ rated power)*  
*Nominal Coverage Angles:*  
*40° H x 60° V, above 2 kHz*  
*Crossover Frequency: 1.2 kHz*  
*L.F. Driver: CXL-2580C*  
*H.F. Driver: DE 750/8*  
*Input Connectors: 2 x NL4*  
*Dimensions:*  
*21.25" H x 17.25" W x 15.25" D*  
*Weight: 71 lbs*

**SW-2.2**, When maximum reliability and SPL is required, the SW-2.2 is the choice. Used with the TOC™ S2 processor, the SW-2.2 contains the same components as the SW-1.2 (minus the passive network) and gets the greatest performance out of them.

The TOC™ S2 processor contains: four pole linear phase dividing filters, precise equalization, Time Offset Correction (TOC™) and limiters.

The SW-2.2 features are similar to SW-1.2 with this difference.

- Contains no passive dividing network since the system is intended to be biamplified.

#### **SW-2.2 Specifications:**

*Frequency Response: 55 to 16kHz*  
*Power Rating: LF: 400 watts*  
*HF: 100 watts*  
*Nominal Impedance: LF: 8 ohms*  
*HF: 8 ohms*  
*Sensitivity (1w/1m): 100 dB*  
*Maximum SPL: 126 dB @ 1meter*  
*(@ rated power)*  
*Nominal Coverage Angles:*  
*40° H x 60° V, above 2 kHz*  
*Crossover Frequency: 1.2 kHz*  
*L.F. Driver: CXL-2580C*  
*H.F. Driver: DE 750/8*  
*Input Connectors: 2 x NL4*  
*Dimensions:*  
*21.25" H x 17.25" W x 15.25" D*  
*Weight: 65 lbs*

*Due to limitations of the passive dividing networks the long term average power rating of the SW-1 and SW-1.2 is limited to 200 watts (40 volts into 8 ohms). This in no way affects their transient capabilities. PAS recommends amplifiers that produce at least twice this power (400 watts into 8 ohms) for these cabinets. Since the SW-2.2 does not contain a dividing network, it does not have this limitation.*



***VM-1***



***RS-1BB***

***RS-2BB***



**VM-1**, This 12 inch concentric design is a super compact vocal foldback monitor. Since the VM-1 has a 12 inch low frequency driver and does not contain a separate high frequency device, it has the smallest footprint and lowest profile. The result is the most compact stage monitor in the TOC™ line.

Concentric speaker design combined with the ideal phase response produced by Time Offset Correction (TOC™) and equalization makes the VM-1 a high definition monitor and allows much higher gain before feedback.

The VM-1 features:

- Concentric 12" loudspeaker.
- Extended high frequency 1" compression driver.
- Passive dividing network with Time Offset Correction (TOC™) and equalization.
- Baltic birch cabinet.
- Foam backed steel grille.
- Recessed handles.
- Pole mount.
- Super compact enclosure for improved sight lines..

#### **VM-1 Specifications:**

*Frequency Response: 60 to 16kHz*

*Power Rating: \*300 watts*

*Nominal Impedance: 8 ohms*

*Sensitivity (1w/1m): 99 dB*

*Maximum SPL: 124 dB @ 1meter  
(@ rated power)*

*Nominal Coverage Angles:  
40° H x 60° V, above 2 kHz*

*Crossover Frequency: 1.2 kHz*

*L.F. Driver: CX-1280C*

*H.F. Driver: DE 45/8*

*Input Connectors: 2 x NLA*

*Dimensions:*

*18" H x 14.5"W x 15.5"D*

*Weight: 50 lbs*

**RS-1BB**, This Subwoofer is essentially the low frequency section of an RS-1. Dual 15 inch long excursion woofers are used to supplement RS-1s in systems requiring additional low frequency power in arrays. In the identical physical package as an RS-1 it can also be used to complement FT-1s or SW-1s when they are used in full range systems.

The RS-1BB is particularly useful in flown systems when subwoofers cannot be placed on the floor.

The RS-1BB features:

- Dual 15" woofers for extended low frequencies.
- Baltic birch cabinet construction.
- Foam backed steel grille
- Recessed handles.
- Fly hardware (anchor plate or optional truss array w/steel reinforcement.
- Compact enclosure design for ease in installation.

#### **RS-1BB Specifications:**

*Frequency Response: 40 to 1kHz*

*Power Rating: \*800 watts*

*Nominal Impedance: 4 ohms*

*Sensitivity (1w/1m): 99 dB*

*Maximum SPL: 128 dB @ 1meter  
(@ rated power)*

*Drivers: 2 x HL-1580CNP*

*Input Connectors: 2 x NLA*

*Dimensions:*

*35.35" H x 17.25"W x 24"D*

*Weight: 101 lbs*

**RS-2BB**, This subwoofer is a higher powered version of the RS-1BB. It uses 4" voice coil 15 inch long excursion woofers and is used with RS-1.2s or RS-2.2s in systems requiring additional low frequency power in arrays. It can also be to compliment the smaller 1.2 and 2.2 cabinets when they are used in full range systems.

Like the RS-1BB, the RS-2BB can also be used in flown systems when subwoofer cannot be placed on the floor.

The RS-2BB features are similar to the RS-1BB with this difference.

- It contains dual 4 " voice coil 15" woofers.

#### **RS-2BB Specifications:**

*Frequency Response: 40 to 1kHz*

*Power Rating: \*1000 watts*

*Nominal Impedance: 4 ohms*

*Sensitivity (1w/1m): 100 dB*

*Maximum SPL: 129 dB @ 1 meter  
(@ rated power)*

*Drivers: 2 x HL-2580CNP*

*Input Connectors: 2 x NLA*

*Dimensions:*

*35.35" H x 17.25"W x 24"D*

*Weight: 107 lbs*

*Due to limitations of the passive dividing networks the long term average power rating of the VM-1 is limited to 200 watts (40 volts into 8 ohms). This in no way affects their transient capabilities. PAS recommends amplifiers that produce at least twice this power (400 watts into 8 ohms) for these cabinets.*



***EB-1***



***CB-2***



**EB-1**, This single 18 inch woofer system provides extended low frequency energy in a compact enclosure.

With fundamental bass response to 35Hz., the EB-1 is the ideal subwoofer compliment to FT, or SW cabinets when they are used in full range systems or when space is at a premium.

Their small footprint and medium weight makes the EB-1 particularly useful when the crew is limited. They can be moved by one person and be stacked in multiples of four so that their centers are within 24" of each other, thereby getting the benefits multiple woofers without large cabinets.

#### **The EB-1 features:**

- Single 18" long excursion woofer for extended low frequencies.
- Baltic birch cabinet construction.
- Foam backed steel grille.
- Recessed handles.
- Compact enclosure for ease in installation.

#### **EB-1 Specifications:**

*Frequency Response: 35 to 300Hz*

*Power Rating: \*600 watts*

*Nominal Impedance: 8 ohms*

*Sensitivity (1w/1m): 99 dB*

*Maximum SPL: 126 dB @1 meter  
(@ rated power)*

*Driver: HL-2880CNP*

*Input Connectors: 2 x NLA*

*Dimensions:*

*30.75" H x 21.25" W x 17.84" D*

*Weight: 81 lbs*

**CB-2**, This is the ultimate TOC™ subwoofer. Dual 18 inch long excursion woofers create massive fundamental bass down to 30 Hz.

When used on it's side, the CB-2 becomes a staging platform for TOC™ full range systems. Three RSor FT systems will sit directly on top of a CB-2.

The CB-2 features:

- Dual 18" long excursion woofers for extended low frequencies.
- 3/4" Baltic birch cabinet construction.
- Foam backed steel grille.
- Recessed handles.
- Supplements all TOC™ full range systems.

#### **CB-2 Specifications:**

*Frequency Response: 30 to 300Hz*

*Power Rating: \*1000 watts*

*Nominal Impedance: 4 ohms*

*Sensitivity (1w/1m): 102 dB*

*Maximum SPL: 129 dB @1 meter  
(@ rated power)*

*Drivers: 2 x HL-2880CNP*

*Input Connectors: 1 x NLA*

*Dimensions:*

*22.5" H x 52" W x 24" D*

*Weight: 170 lbs*

\*Power testing is done for eight hours using band limited pink noise at a voltage which corresponds to the rated power of the system into it's minimum impedance. Since music and voices have peaks that are much higher than the average level, the noise source used has a crest factor (peak to RMS ratio) of 6 dB.

*Concentric  
Design*



## ATTENTION TO DETAIL.

The development of high performance loudspeakers found in the TOC™ Systems Group begin with the component design. Strict attention to every detail in the component maximizes output and provides lasting quality.

The expanded view of the Concentric loudspeaker demonstrates PAS's obsession with quality components:

### 1. Polyfoam Edge Treatment

In the crossover region, the low and high frequency components must smoothly combine.

Cancellations occur as the sound energy leaves the horn flair and enters the air. These cancellations are due to reflections from the edges of the horn. The Polyfoam Edge Treatment minimizes these cancellations, increasing output and providing smooth response in this frequency range.

### 2. Constant Coverage Horn Design

Consistent pattern control is of major consideration in a quality sound installation or high performance live reinforcement system.

PAS has pioneered the development of constant coverage horns in concentric speaker design.

### 3. Kevlar Fiber

All low frequency cones used in the TOC™ System Group are reinforced with Kevlar Fibers.

Kevlar Fibers strengthen the cone without adding undesirable mass. These structurally superior cones increase acoustical output and minimize distortion.

### 4. Edge wound Ribbon Voice Coils

Edge wound voice coils provide the highest density of windings in the magnetic field.

PAS uses a proprietary technique of chemically bonding the Ribbon wire to the voice coil form. This technique results in loudspeaker components with the highest Thermal Power capability.

### 5. Die Cast Aluminum Frames

Aluminum speaker frames guarantee lasting quality in a loudspeaker component.

Increased structural rigidity maintain precision alignment in the complex concentric design.

### 6. High Output Magnet Assemblies

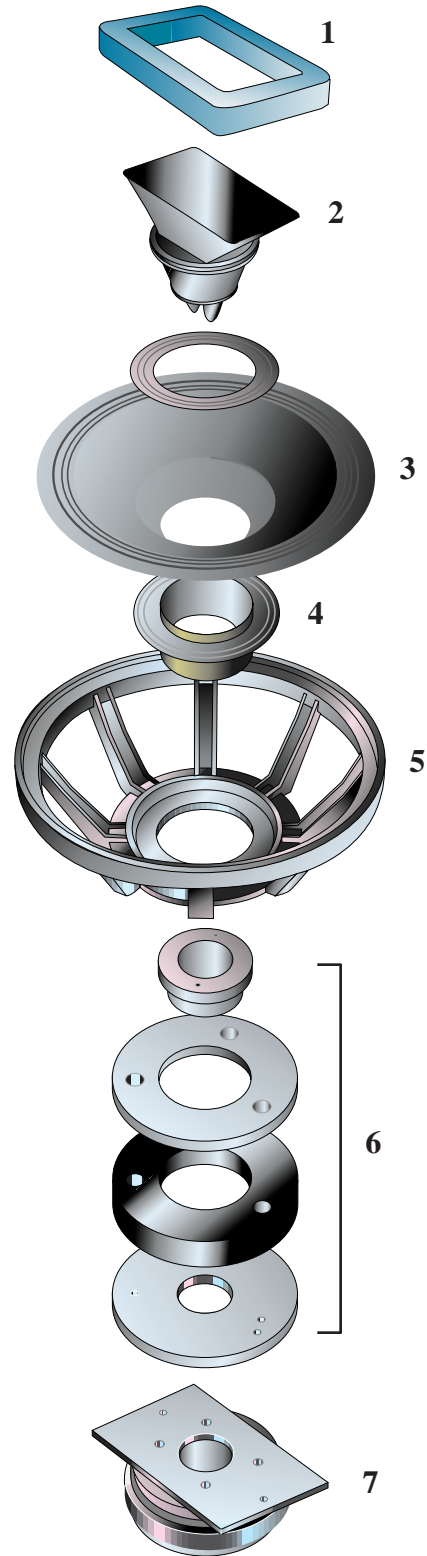
Blanchard ground steel plates with precision machining combined with a high output magnet material guarantees consistent performance and lasting quality.

PAS's attention to the highest quality standard is demonstrated when one compares our magnet assemblies to the competition.

### 7. Extended High Frequency 2 inch Compression Driver

Copper Shorting Ring on phasing plug provides extended high frequencies in a 2 inch compression driver.

The performance level of this component maintains low distortion in the mid frequencies without sacrificing high frequency energy.



## *Active Filters*



## *Passive Filters*



## ACTIVE TOC™ SYSTEMS

When maximum performance and reliability is required, the 2 channel TOC™ processor is the solution.

The TOC™ processor allows PAS engineers to more precisely dial in the performance of the TOC™ Systems Group. The result is a loudspeaker system with smoother amplitude response, increased bandwidth and reliability with the ideal phase response found in TOC™ products. This processor includes:

- Four Pole Linear Phase Dividing filters.
- Time Offset Correction.
- Precise equalization.
- High pass filters for low frequency excursion protection.
- Compressors/Limiters for component protection.
- Subwoofer output.

## PASSIVE DIVIDING NETWORKS WITH TOC™

Dividing networks separate and deliver the appropriate frequency ranges to the components designed to accommodate those frequencies. How the components are combined through the network design will determine the quality and performance of the loudspeaker.

PAS engineering incorporates a number of filter types resulting in a seamless transition between components. These complex networks set a performance standard in the TOC™ Systems Group that clearly surpasses the competition. These passive networks include:

- Linear phase dividing filters.
- Time Offset Correction, allowing all components to propagate energy from an identical acoustic source.
- Amplitude equalization networks.
- Impedance equalization networks.

The combination of these elements results in ideal phase response, characteristic of all products of the TOC™ Systems Group.

## TOC™ PROCESSOR SPECIFICATIONS:

### INPUT:

<b>Type</b>	<i>XLR, Electronically Balanced (Differential), AC coupled</i>
<b>Maximum Input Level</b>	<i>+24 dBv (16 VRMS) (20-20 kHz)</i>
<b>Input Impedance</b>	<i>28k ohm differential (balanced) 4k ohm to ground (from pin 2 or 3)</i>
<b>Common Mode Rejection</b>	<i>&gt;50 dB (20-20kHz)</i>

### OUTPUT:

<b>Type</b>	<i>XLR, Electronically Balanced (Differential), AC coupled (Transformer isolated option board)</i>
<b>Maximum Output Level</b>	<i>+24 dBv, Balanced: +18 dBv, Unbalanced Switchable with no change in gain.</i>
<b>Output Impedance</b>	<i>22 ohm</i>
<b>Maximum Load</b>	<i>150 ohm</i>
<b>Maximum Capacitive Load</b>	<i>33 nf (Stable with &gt;500 feet of belden snake cable.)</i>

### MECHANICAL

<b>Dimensions</b>	<i>19" (483mm) wide 3.475" (88mm) high 8.5" (216mm) behind mounting surface</i>
<b>Weight</b>	<i>9 lb. 12 oz (4.43 kg)</i>

### ELECTRICAL

<b>Option</b>	<b>Voltage Range</b>	<b>Fuse</b>
<i>120v</i>	<i>90-135 V 50-60 Hz</i>	<i>630 ma</i>
<i>230v</i>	<i>190-270 V 50-60 Hz</i>	<i>315 ma</i>
<i>100v</i>	<i>75-115 V 50-60 Hz (100 V special order for Japan)</i>	<i>800 ma</i>
<b>Line Voltage Power</b>	<i>25 watts</i>	



TOC™ processors meet the requirements of the Disturbance Voltage (CE), Disturbance Current (RE), and Steady State Harmonics tests in accordance with EN55013-1990 and EN 61000-3-2:1995. They comply with EN 60065:1994 (73/23/EEC Low Voltage Directive).

*12CX*

*22CX*



*15CX*

*25CX*



## TOC™ 360 SERIES

The TOC™ 360 series are high powered coaxial systems in fireproof metal enclosures for installation in plenum or suspended ceilings in large facilities. Their high power capacity and controlled dispersion makes them appropriate in areas with high noise levels and very high ceilings. Each model contains a dividing network with Time Offset Correction (TOC™) optimized for the coaxial driver used. Passive time delay and equalization are used to allow the high and low frequency components to accurately combine for the best transient performance.

PAS has been manufacturing coaxial systems with TOC™ for many years. The transient accuracy of these products enables voices to be intelligible at higher ambient sound levels than those without TOC™. Incorporating this into systems for distributed use brings a new level of performance to paging systems for large facilities.

The high frequency coverage angle is a cone with an included angle of 70° at -6 dB. This coverage angle reduces reflections from walls which waste power and are detrimental to intelligibility. In large installations where the ceiling is very high, a moderate coverage angle minimizes overlap of the coverage patterns of adjacent loudspeakers. This reduces articulation loss due to differing arrival times.

High power capacity and sensitivity produces spl peaks of greater than 106 dB at 30 feet or 103 dB at 50 feet.

The TOC™ 360 series comes in metal enclosures constructed of 18 gauge cold rolled steel with walls damped with acoustic fiberboard. They are lined with 1.5" thick glass wool and have conduit knockouts on all four sides. Mounting tabs are on parallel sides to facilitate recessed mounting. Each is supplied with a beveled white metal grille.

All models are available with an optional 200 watt, 70 volt matching transformer.

## 12 CX SPECIFICATIONS

*Frequency Response: 80 to 16Hz*  
*Power Rating: \*300 watts*  
*Nominal Impedance: 8 ohms*  
*Sensitivity (1w/1m): 100 dB*  
*Maximum SPL: 126 dB @1 meter*  
*Nominal Coverage Angle: 70°*  
*Crossover frequency: 2 kHz*  
*L.F. Driver: 12 inch*  
*H.F. Driver: 1 inch throat*  
*Dimensions: 23" L x 18"W x 12"D*  
*Weight: 54 lbs*

## 15CX SPECIFICATIONS

*Frequency Response: 60 to 16Hz*  
*Power Rating: \*350 watts*  
*Nominal Impedance: 8 ohms*  
*Sensitivity (1w/1m): 99 dB*  
*Maximum SPL: 125 dB @1 meter*  
*Nominal Coverage Angle: 70°*  
*Crossover frequency: 2 kHz*  
*L.F. Driver: 15 inch*  
*H.F. Driver: 1 inch throat*  
*Dimensions: 29.5" L x 18"W x 15"D*  
*Weight: 91 lbs*

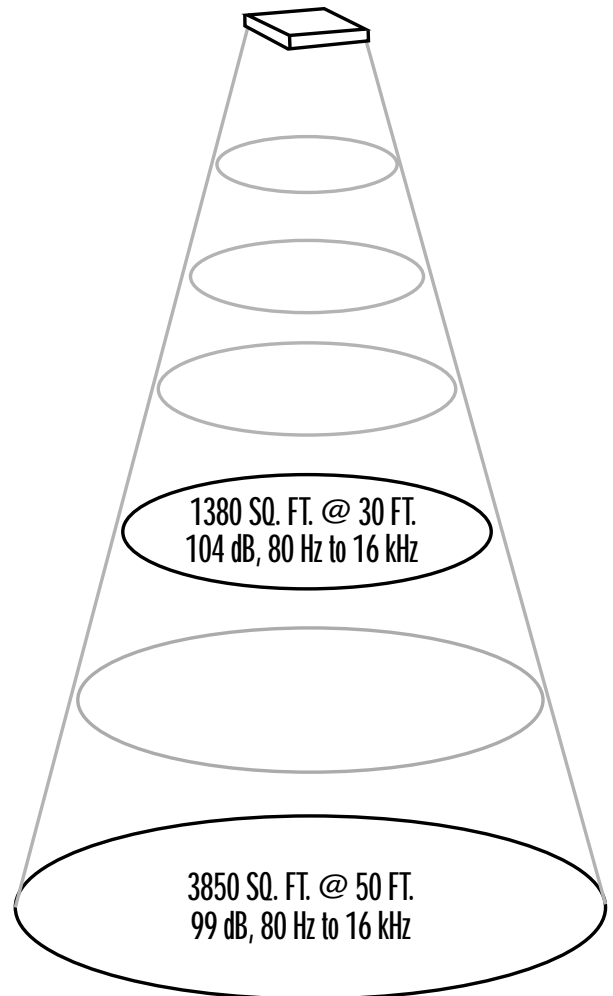
## 22CX SPECIFICATIONS

*Frequency Response: 80 to 16Hz*  
*Power Rating: \*600 watts*  
*Nominal Impedance: 8 ohms*  
*Sensitivity (1w/1m): 100 dB*  
*Maximum SPL: 128 dB @ 1 meter*  
*Nominal Coverage Angle: 70°*  
*Crossover frequency: 1.4 kHz*  
*L.F. Driver: 12 inch*  
*H.F. Driver: 2 inch throat*  
*Dimensions: 23" L x 18"W x 15"D*  
*Weight: 63 lbs*

## 25CX SPECIFICATIONS

*Frequency Response: 50 to 16Hz*  
*Power Rating: \*600 watts*  
*Nominal Impedance: 8 ohms*  
*Sensitivity (1w/1m): 99 dB*  
*Maximum SPL: 127 dB @ 1 meter*  
*Nominal Coverage Angle: 70°*  
*Crossover frequency: 1.2 kHz*  
*L.F. Driver: 15 inch*  
*H.F. Driver: 2 inch throat*  
*Dimensions: 29.5" L x 23"W x 15"D*  
*Weight: 96 lbs*

70°x 70°  
CONICAL COVERAGE



*Due to limitations of the passive dividing networks the long term average power rating of these products is limited to 200 watts (40 volts into 8 ohms). This in no way affects their transient capabilities. PAS recommends amplifiers that produce at least twice this power (400 watts into 8 ohms) for these cabinets. For the 70 volt option the power rating is limited to the transformer.*



## *Space Efficiency*



The Compact Design of the TOC™ Systems Group provides numerous advantages to the live sound professional.

Stage Space is at a premium for most venues. The CB-2 provides the ideal platform base for groups of 3xRS models or 3xFT models.

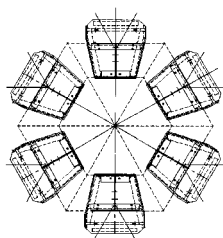
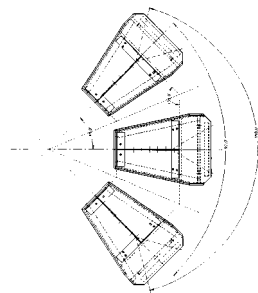
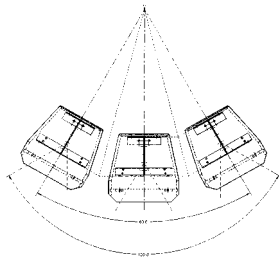
The photograph on this page is comprised of 2 CB-2s, 3 RS-1.2s and 3 FT-1.2s. The floor space required for this Stack is 24" x 52" or 8.67 square feet. The overall height is 8.5 feet.

One Stack per side will cover a 5,000 seat Concert Hall including the Balcony. Requiring only 17 square feet of stage floor area.

Truck Pack is a major concern for the tour manager. With room to spare, 24 of the stacks shown would pack into a 28 foot trailer that has a clear height of 8.5 feet.

TOC™ Systems Group will provide the highest definition and the highest spl when compared to all others in its class.

## *Flying Options*



### **EASE OF INSTALLATION**

Versatile flying options make the TOC™ Systems Group unparalleled for ease of installation and set-up.

Compact design, Trapezoidal enclosures, and Two flying options provide the sound installer with the flexibility needed to address numerous install challenges.

Anchor Plate with Detachable Fly-ring. All trapezoid enclosures in the group include multiple Anchor Plate hardware for single enclosure hanging.

Each Anchor Plate location has steel reinforcement plates bolted to the enclosure with hardened steel aircraft fasteners. Fly-rings may be placed as required to provide maximum support and to provide the required dispersion angle.

Truss Brackets. As an option, the TOC™ Systems Group has trussing hardware for multiple enclosure arrays.

All trapezoid enclosures have installed provisions to accept the Truss Brackets. To provide safe and secure arrays, the Truss Bracket is installed on each enclosure in the array.

A selection of Interconnect Brackets are available to provide a variety of coverage angles. The Interconnect Brackets are available for 30°, 45°, and 60° separation between the enclosures of the array.

The diagrams shown suggest the variety of arrays that maybe assembled with the combination of Truss and Interconnect Brackets. PAS Customer Service provides assistance in selecting the appropriate combinations of hardware to fit your installation requirement.



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