

E SERIES

ENTASYS

HIGH-PERFORMANCE COLUMN LINE-ARRAY SYSTEM



INSTALLATION/OPERATION MANUAL



EC STATEMENT OF CONFORMITY

EC STATEMENT OF CONFORMITY

This document confirms that the range of products of Community Professional Loudspeakers bearing the CE label meets all of the requirements in the EMC directive 89/336/EEC laid down by the Member States Council for adjustment of legal requirements. Furthermore, the products comply with the rules and regulations referring to the electromagnetic compatibility of devices from 30-August-1995.

The Community Professional Loudspeaker products bearing the CE label comply with the following harmonized or national standards:

DIN EN 55013:08-1991

DIN EN 55020:05-1995

DIN EN 55082-1:03-1993

The authorized declaration and compatibility certification resides with the manufacturer and can be viewed upon request. The responsible manufacturer is the company:

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NOTICE: Every effort has been made to insure that the information contained in this manual was complete and accurate at the time of printing. However, due to ongoing technical advances, changes or modifications may have occurred that are not covered in this manual. The latest version of this manual and the most recent product information published by Community is always available at <http://www.communitypro.com> on the world wide web.

WELCOME TO COMMUNITY

A TRADITION OF EXCELLENCE AND INNOVATION

Since the founding of our company in 1968, Community has been a constant developer and innovator of loudspeaker technology. Many of our engineering achievements were undertaken to solve problems, when no prior solutions existed. Others resulted from simply seeing a better way to do things.

Over the years our technologies have been imitated, and our methods have become common practice throughout the professional sound industry. However, developments like carbon fiber diaphragm compression drivers still stand alone, and well ahead of the competition. Just a few of Community's unique accomplishments include the following:

- First successful fiberglass mid, high frequency, and large-format bass horns.
- First compression loaded mid-range horn for touring systems - the LMF.
- First suspension-less diaphragm HF driver - the VHF100.
- First mid-range, full-decade (200 Hz - 2 kHz) high-power compression driver - the M4.
- First carbon fiber diaphragm compression drivers - M4, EM280, EM282.
- First Ferrofluid-cooled professional woofers - the VBS Series.
- First product series with all drivers Ferrofluid-cooled.
- First air-cooled loudspeakers for touring systems - AirForce.
- First three-way cinema loudspeaker systems - Paramount Executive Studio Theatre, Warner Bros. screening theatre and dubbing rooms.
- First electro-acoustic system to equal the sound level of pneumatic warning sirens.
- First to provide loudspeaker coverage over an entire country - Denmark Emergency System.
- First comprehensive, calibrated data acquisition of sound reinforcement products.
- First integral signal-aligned three-way sound reinforcement systems - RS Series.
- First pro audio company with an Internet Web site.
- First all horn-loaded, high-fidelity, weather-resistant loudspeaker - R2 Series.

In line with our history of excellence and innovation, each Community product is manufactured in accordance with a complicated and exacting chain of procedures that ensure absolute quality.

With our unique designs, our sophisticated techniques, and our proprietary materials and transducers, we are committed to bringing only the finest audio products to the many thousands of professional sound engineers, performers, and end users who rely on them daily.

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IMPORTANT SAFETY INFORMATION

IMPORTANT SAFETY INFORMATION

Always follow these safety precautions when using or installing ENTASYS loudspeakers and accessories:

- Read and keep these instructions.
- Heed all warnings.
- Follow all instructions, particularly those pertaining to rigging, mounting, hanging, and electrical connections.
- Only use accessories that are specified and approved by the manufacturer.

The terms **IMPORTANT**, **WARNING**, and **DANGER**, as used in this manual, alert the reader to important safety considerations. If you have any questions or do not understand the meaning of these terms, do not proceed with installation. Contact your local dealer, distributor, or call Community directly for assistance.



IMPORTANT: describes an operating condition or user action that may expose the equipment or user to potential damage or danger.



WARNING: describes an operating condition or user action that will likely cause damage to the equipment or injury to the user or to others in the vicinity.



DANGER: describes an operating condition or user action that will immediately damage the equipment and/or be extremely dangerous or life threatening to the user or to others in the vicinity.

RIGGING AND ELECTRICAL SAFETY



DANGER: The loudspeakers described in this manual are designed and intended to be ‘flown’ or suspended using a variety of rigging hardware, means, and methods. Installation of loudspeakers should only be performed by trained and qualified personnel. It is strongly recommended that a licensed and certified professional structural engineer approve the mounting design. Severe injury and/or loss of life may occur if these products are improperly installed!



DANGER: *All rigging fittings must be fully tightened and secured. Any missing fasteners will compromise the structural integrity of the enclosure and constitute a safety hazard. Do not suspend this loudspeaker unless all fasteners are securely in place!*



IMPORTANT: Refer to the sections on installation and connections later in this manual for additional information on rigging and electrical safety.

UNPACKING AND INSPECTION

UNPACKING AND INSPECTION

ENTASYS loudspeakers are inherently rugged and are carefully packed in sturdy cartons. However, it's wise to thoroughly inspect each unit after it has been removed from the packaging, as damage could occur during shipping.

SHIPPING CLAIMS

Please note that once the shipment has left your dealer or the Community factory, the responsibility for damage is *always* borne by the freight company. If damage has occurred during shipping, you must file a claim directly with the freight company. It's very important to contact the freight company as soon as possible after receiving your shipment, as most freight companies have a short time limit within which they will investigate claims. Make sure to save the carton and the packing material, as most claims will be denied if these materials are not retained. Your Community dealer and the factory will try to help in any way they can, but *it is the responsibility of the party receiving the shipment to file the damage claim.*

It's always a good idea to retain the carton and packing materials indefinitely, if possible, in the event that the unit may need to be returned to your dealer or distributor for repair in the future.

WHAT'S IN THE BOX

Each shipping carton contains the following items:

ENTASYS Loudspeaker System (Qty 1)

Installed on loudspeaker:

M4 x 12 mm Socket Head Set Screws (Qty 8)

Mounting Bracket (Qty 1)

Mounting Bracket Bottom Fitting (Qty 1)

M6 x 16 mm Socket Head Set Screw (Qty 1)

Operation and Installation Manual (Qty 1)

Warranty Card (Qty 1)

Dual Banana Plug Jumper (Qty 1)

Rubber Plug (Qty 1), for sealing top banana plug recess

Bottom Cover Panel (Qty 1), for bottom input connectors

M3 x 30 mm Cover Panel Attachment Screws (Qty 2)

2 mm Hex Wrench (Qty 1), for M4 set screws

3 mm Hex Wrench (Qty 1), for M6 set screw

34.2 mm MF-HF Spacers (Qty 10); ENTASYS Full-Range only

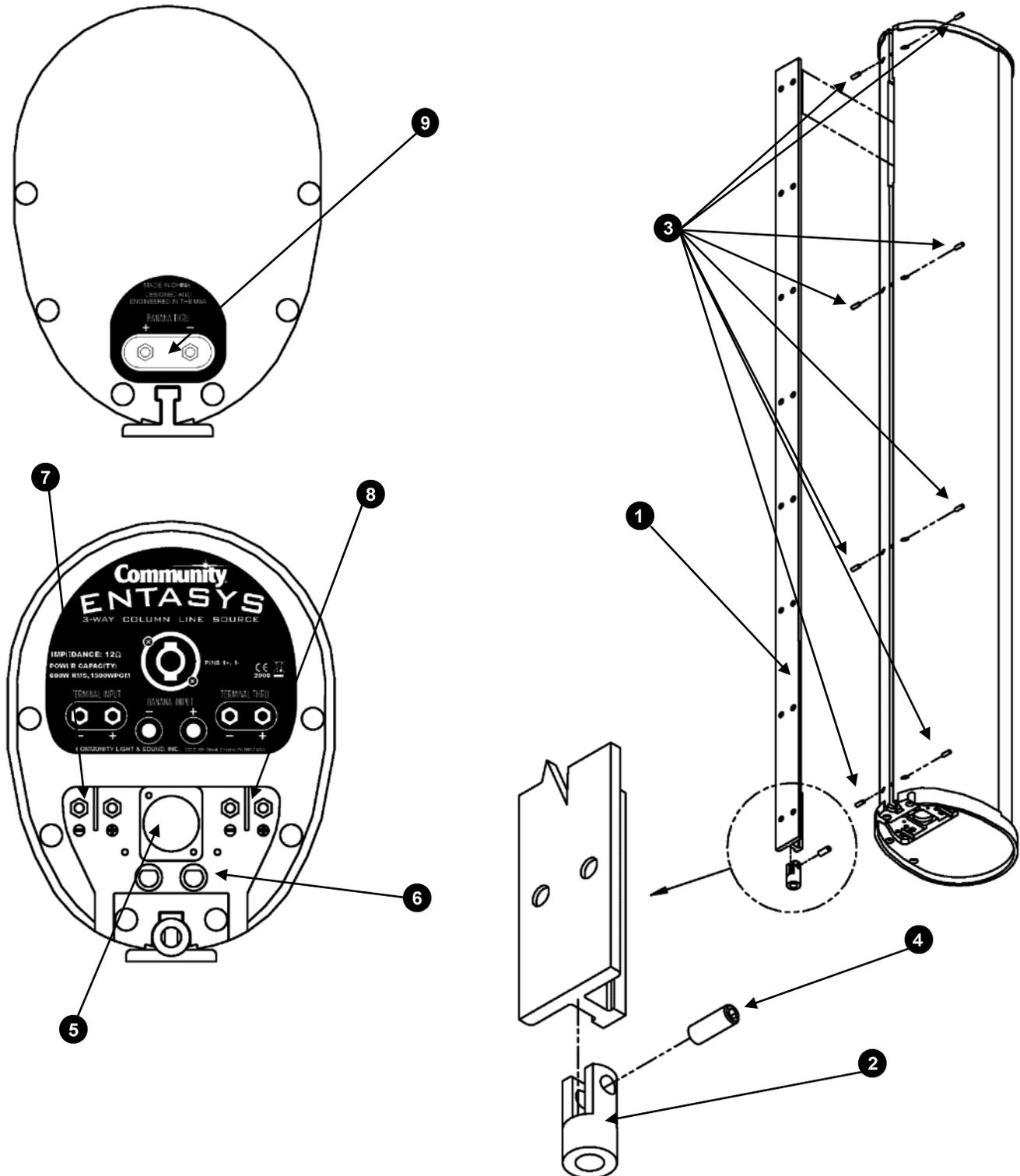
M4 x 60 mm Phillips Head Screws (Qty 20), for MF-HF spacers; ENTASYS Full-Range only

QUICK START - FEATURES

ENTASYS FEATURES

Figure 1 below on this page and Table 1 on the following page identify basic ENTASYS features.

Figure 1: ENTASYS Features



QUICK START - FEATURES

Table 1: ENTASYS Features
(Refer to Figure 1 on opposite page)

	ITEM	DESCRIPTION
1	MOUNTING BRACKET	1, attached to loudspeaker
2	BOTTOM FITTING	1, attached to Mounting Bracket
3	M4 SET SCREWS	8, to hold Mounting Bracket in place
4	M6 SET SCREW	1, to hold Bottom Fitting in place
5	NL4-COMPATIBLE LOCKING CCONNECTOR	4 pole NL4MP-type jack, wired in parallel with other input and thru connectors. Accepts NL4FC-type connectors for signal input to loudspeaker. Use terminals 1±. Terminals 2± are not connected.
6	DUAL BANANA JACK INPUT CONNECTOR	Standard dual banana jack for input to loudspeaker.
7	BARRIER STRIP INPUT TERMINALS	Nuts on threaded posts to accept bare wire or lugs for input to loudspeaker.
8	BARRIER STRIP THRU TERMINALS	Nuts on threaded posts to accept bare wire or lugs for output to another loudspeaker.
9	DUAL BANANA PLUG THRU CONNECTOR	Standard dual banana jack for output to another loudspeaker. Can be used with supplied banana jumper pin to connect to ENTASYS loudspeakers when stacking them.

Note: The Bottom Fitting must be securely fastened to the Mounting Bracket. This fitting supports the entire weight of all ENTASYS loudspeakers stacked together. This fitting must be removed from any upper ENTASYS loudspeakers that are to be stacked on top of another ENTASYS loudspeaker.

QUICK START - INSTALLATION

ELECTRICAL INSTALLATION AND SAFETY

Electrical Safety



DANGER: The output voltage and current capabilities of audio power amplifiers present a danger to installers especially in 70-volt and 100-volt distributed systems. To minimize the risk of electric shock from loudspeaker connecting cables, confirm that the power amplifiers are turned “off” before connecting loudspeaker cable to the loudspeaker or amplifier.

Electrical Connections and Cabling

Input signal cabling for ENTASYS loudspeakers can be connected to either the NL4 connector, dual banana jack, or the input terminal strip on the bottom of the loudspeaker. A weather-resistant cover can be attached to protect the input connectors from moisture and debris. Two relief areas in the bottom end cap allow for cable up to the size of 16-2 SJO with the cover in place. Larger cable can be accommodated via the knock out in the cover. A 1/2 inch NPT conduit fitting can be secured to this knock out.

When stacking two ENTASYS loudspeakers together the input signal can easily pass from the bottom loudspeaker to the top loudspeaker using the supplied Banana Plug Jumper. Insert this jumper into the Banana Thru connector on the top of the lower loudspeaker. When the upper loudspeaker is placed on top of the lower loudspeaker, the Banana Plug Jumper will fit into the Banana Input Jack of the upper loudspeaker. No other connecting cable for the upper loudspeaker is required.

The top most ENTASYS in an array should have the included rubber plug inserted into the Banana Thru relief at the top of the loudspeaker. This will prevent moisture or debris from entering this relief area. This rubber plug should not be used for lower ENTASYS loudspeakers in an array.

Up to three ENTASYS Full-Range or ENTASYS Low Frequency loudspeakers can be electrically connected in this manner and present the driving amplifier with a 4 ohm load.

See the Installation section for more information including high pass filters for ENTASYS. ENTASYS is a passive only loudspeaker system and cannot be bi-amplified or tri-amplified.

** Also see Pages 38-39 for “Impedance” and “Recommended Amplifier Size”*

Outdoor Installations—Minimum Downward Installation Angle



NOTE: Whenever ENTASYS column loudspeakers are installed outdoors, or exposed to direct rain, water or precipitation, the loudspeaker enclosure must be angled downward at a minimum of two (2) degrees.

QUICK START - INSTALLATION

MECHANICAL INSTALLATION AND SAFETY

Rigging and Safety

All ENTASYS models are designed to be suspended (flown) using only the included or optional ENTASYS rigging hardware, means, and methods.

To suspend an ENTASYS loudspeaker the Mounting Bracket should be removed from the loudspeaker and attached to its intended suspension means. The ENTASYS loudspeaker should then be installed on the Mounting Bracket, taking care to align the tab at the top of the Mounting Bracket with the slot in the loudspeaker. Make sure there is a Bottom Fitting at the bottom of the lower most Mounting Bracket and that its M6 set screw is securely in place. This fitting must support the entire weight of the loudspeaker. Once the ENTASYS loudspeaker is on the Mounting Bracket, fully tighten each of the eight M4 set screws to secure it to the Mounting Bracket.



NOTE: The Bottom Fitting should be removed from the Mounting Bracket used for ENTASYS loudspeakers which are stacked on top of other ENTASYS loudspeakers. If this fitting is in place the loudspeakers will not stack together properly. Only one bottom fitting should be used for each stacked array.



WARNING: It is essential that all installation work involving the suspension of these loudspeaker products be performed by competent, knowledgeable persons who understand safe rigging practices. Severe injury and/or loss of life may occur if these products are improperly installed.



WARNING: The M4 set screws that secure the Mounting Bracket must be fully tightened after mounting the ENTASYS loudspeaker. These set screws are not tightened prior to shipping to facilitate the removal of the Mounting Bracket. Failure to properly install ENTASYS suspension hardware could result in injury or death!

As described in the Accessories section of this manual, Community offers a variety of mounting hardware including brackets, set screws, bolts, and various fly kits. ENTASYS comes with an included Mounting Bracket. Optional mounting hardware is available for additional positioning and aiming functionality. Detailed installation instructions for each mounting accessory is included with that item.

FOR MORE INFORMATION

For more information on installing and operating your ENTASYS loudspeaker, please refer to the "Installation" section of this manual or go to Community's web site at www.communitypro.com.

For applications support, service or warranty information, refer to Community's web site or contact Community at 800-523-4934 or 610-876-3400.

INTRODUCTION

INTRODUCTION

Thank you for selecting Community ENTASYS Column Line Source Loudspeakers. ENTASYS features controlled, narrow vertical directivity with wide horizontal coverage. The ENTASYS Full-Range loudspeaker and Low Frequency loudspeaker may be combined in several ways to yield outstanding performance for a wide range of applications. They are easy to install and provide unparalleled sound quality in a loudspeaker of this type.

This manual is intended to help you install and use ENTASYS loudspeakers safely and effectively. It provides useful information to help you obtain the best performance, sound quality, and reliability from your ENTASYS system. We've provided a series of Quick-Start diagrams to enable you to operate your loudspeakers immediately if required; however, we recommend that you read this manual to help insure that your ENTASYS installation meets the highest possible standards.

ENTASYS Features and Technology

ENTASYS loudspeakers offer numerous features and technology that provide unprecedented sonic quality and installation flexibility. Some of these include:

- Unique three-way full-range line array column with advanced passive crossover technology
- Patent-pending Compact Ribbon Emulator high frequency elements provide narrow, well-behaved vertical directivity control
- Midrange and high frequency drivers use sealed polymer frames and diaphragms for inherent weather-resistance
- Low frequency drivers have a 100% epoxy impregnated cone with a large polymer dust cap covering the voice coil for weather resistance
- DYNA-TECH protection circuitry helps to minimize damage to drivers
- Heavy gauge extruded aluminum enclosure with power coat finish and gasket sealed, impact resistant nylon end caps are weather-resistant
- Protective steel grilles covered with rugged powder coat finish
- Multiple brackets and suspension options to suit almost any application
- Seamless array ability, both acoustically and cosmetically
- A large three column array can be driven with a single amplifier channel
- NL4-compatible locking connectors and terminal strip connectors for ease of wiring
- Available in black or white

INTRODUCTION

DYNA-TECH™ Driver Protection Circuitry

DYNA-TECH and DYNA-TECH Plus are multiple stage protection mechanisms that trigger on different aspects of the input signal. The first stage is dedicated to the high frequency drivers. It will not allow the voltage delivered to the input terminals of the Compact Ribbon Emulator (CRE) devices to exceed their maximum input rating. If this voltage rating is exceeded, a hard limiter engages to clamp the voltage at this threshold.

The second stage of the circuit protects all the drivers in the system. This stage is based on an electro-mechanical relay driven through a voltage sensing circuit. The relay engages at a predetermined voltage, corresponding to an input level that would otherwise cause driver damage. When engaged, the relay introduces a bank of high-wattage resistors in series with the drivers. These resistors cause a voltage drop in the signal to the drivers, thereby reducing the power applied to them. When the relay protection circuit is activated, there will be a noticeable drop in the system's level (approximately 3 to 4 dB). This serves as a warning to the operator that the loudspeaker is being overdriven. When this stage of protection is engaged, the level of the console and/or the amplifier's output to the loudspeaker system should be reduced.



IMPORTANT: If the operator continues to run the system at excessive levels, or worse, if the operator raises the drive level to compensate for the drop in output caused by the protection circuitry, eventually a third stage of protection will engage that shuts down the loudspeaker system entirely. This additional stage of protection will never engage until after the second stage has been triggered. If the system shuts down entirely, the operator can immediately restore sound by simply reducing the drive level to the system.

The only difference between DYNA-TECH and DYNA-TECH Plus is in the first stage, high frequency protection. This is unique to DYNA-TECH Plus and is used on full-range and high frequency loudspeaker systems. Loudspeaker systems that do not employ high frequency drivers use DYNA-TECH.

Advantages of Community's DYNA-TECH Circuitry

There are numerous advantages to this type of multi-stage protection circuitry. The trip point is preset to engage at exactly the same time on all loudspeakers that are powered from the same amplifier channel. The initial stages of DYNA-TECH protection circuitry do not rely on, and are not affected by heat buildup. Some manufacturers use circuit breakers that require heat buildup before they trip. This limits their ability to protect a cold loudspeaker. The trip points of such breakers are also affected by ambient temperature, their own internal heating curves and small variations in loudspeaker impedance or crossover component tolerances, all of which can cause unpredictable behavior. Because the first and second stages of Community's DYNA-TECH circuits are not thermally sensitive, they react nearly instantaneously to protect against an excessive increase in level. Moreover, the protection disengages almost immediately when the drive level to the system is reduced. It is not necessary to wait for a circuit breaker to cool down. This means that your loudspeaker can operate at its full dynamic range and still react quickly to protect against excessive musical peaks, avoiding damage to the system. It also means that your loudspeaker is protected from the moment the power amplifier is plugged in and turned on, regardless of the ambient temperature.

As mentioned above, the protection circuitry provides a final level of protection for the entire loudspeaker to guard it from severe misuse. If the system is operated in the second stage mode of protection for a long time, or if the input level is increased to try to overcome the volume drop from the second stage protection circuitry, a solid-state circuit breaker will trip and remove all signal from the loudspeaker until the input level is reduced. Because this circuit breaker is heat sensitive; it provides a final level of protection that takes heat into account as well as power. However, unlike most implementations of circuit breakers that take time to cool down before resetting, DYNA-TECH circuits respond instantly to a reduction in level, restoring the system to its full dynamic range without needing to wait for the circuit breaker to reset itself.

MODELS

ENTASYS MODELS

The ENTASYS high-performance column line array loudspeaker system is designed for permanent installation in applications such as auditoria, airports, train stations, conference centers, lecture halls, houses of worship, stadium concourses and museums. ENTASYS features a unique three-way Full-Range Column and a Low Frequency Column in the same size enclosure, offering superior performance, high output and high power handling capability in an architecturally appealing design that is weather-resistant for outdoor installations. Unlike other column products on the market, the ENTASYS system provides consistent horizontal and vertical coverage from 800 Hz to 16 kHz from a single loudspeaker.

The ENTASYS line of loudspeakers features just two loudspeaker models but they are able to be configured and deployed to achieve very high SPL, exceptional sound quality and outstanding speech intelligibility. This is accomplished through the use of multiple drivers in each pass band of the loudspeaker system. Particular attention was paid to driver spacing, including the development of a patent-pending Compact Ribbon Emulator, a device that allows a line of 1-inch drivers to effectively produce a single ribbon of energy. The spacing of the drivers used in ENTASYS has been optimized for the frequency region that they reproduce to minimize the formation of grating lobes in the vertical plane.

ENTASYS systems are designed to be modular. Multiple enclosures may be stacked and joined together to form larger column line arrays. The Full-Range and Low Frequency enclosures can be arranged in any order to direct the sound only where it's needed, and to extend the length of the column to provide additional low frequency pattern control. This enables the sound system designer to specify the best performing configuration for a given application.

The only additional items required to make ENTASYS work are a high pass filter and a power amplifier. An equalizer may also be used, if desired, but is not required to deliver exceptional sound quality. Each ENTASYS loudspeaker has its own internal passive crossover to provide the required filtering. An external high pass filter is recommended to allow ENTASYS to reach its maximum performance potential.

All ENTASYS systems are available from the factory in elegant black or white finishes. They can also be ordered in custom colors or painted on-site to match virtually any décor. Each individual enclosure features a compact 5.5 inch wide by 7.375 inch deep “teardrop” shaped footprint and stands 44.5 inches tall. An extremely low-profile T-Bar mounting bracket is included with each ENTASYS column for straight “flush” mounting. Additional mounting options are also available, including an equally low-profile pan mount bracket, a combination pan-tilt mounting bracket, and a fly kit bracket set. Since the connector panels are situated on the top and bottom of the modules, the assemblies can be installed virtually flush with the wall, with invisible connections between modules. The result is an attractive, cost-competitive system with excellent projection and pattern consistency in both horizontal and vertical coverage. ENTASYS systems provide excellent intelligibility, feedback rejection, and wide frequency response. Additional low frequency extension is available with the addition of Community's VLF or VERIS subwoofers systems.

ENTASYS Full-Range Three-Way Column: ENT-FR, ENT-FRW

The ENTASYS Full-Range Column is a three-way loudspeaker system. It consists of six 3.5-inch (90 mm) neodymium low frequency drivers, eighteen 2.35-inch (60 mm) midrange drivers, and forty-two 1-inch x 1-inch (25 mm x 25 mm) high frequency drivers. These high frequency drivers are configured into groups of seven drivers and integrated to form six planar coupled Compact Ribbon Emulator (CRE) devices. These patent-pending high output, low distortion high frequency CRE devices enable ENTASYS to radiate a very narrow, controlled beamwidth into the last octave of typical human hearing before vertical off-axis grating lobes begin to form. This helps to keep the sound focused and directed where it needs to be and not having unintended reflections from venue surfaces.

MODELS

The ENTASYS Full-Range column can also be modified to provide various coverage patterns. The horizontal coverage is a very consistent 120°. The vertical beamwidth is 12° in its default “curved” configuration as shipped. It can be narrowed in the midrange and high frequency region by replacing the smaller stand-offs behind the midrange/high frequency driver modules to use the included 34.2 mm spacers. With the loudspeaker in this “straight” configuration the vertical beamwidth is 6°. The loudspeaker may also be configured as “asymmetrically curved” by replacing the stand-offs at only one end of the column. In this manner, various modular configurations with shaped vertical coverage patterns provide a vast number of coverage combinations.

For most applications of a single ENTASYS full-range column it is recommended to use it in the curved configuration. When two full-range columns are arrayed immediately above and below each other it is recommended to use the straight configuration for each column. The top of the upper column and the bottom of the lower column could remain curved. This will yield a symmetrical array when assembled.

The vertical directivity control in the frequency region of the low frequency drivers, below 1 kHz, is well behaved but the beamwidth begins to increase at lower frequencies. This is not a shortcoming of ENTASYS, but rather the laws of physics for a line array with the height of a single full-range column. The beamwidth in this frequency region can be made significantly more narrow, to match the beamwidth at higher frequencies, simply by adding ENTASYS Low Frequency columns to the array. This can be much more cost-effective than adding full-range columns when the maximum required SPL in the higher frequency region can be achieved in the audience area with a single full-range column.

Part of the performance of ENTASYS is due to its internal passive crossover. This uses high order slopes, passive equalization, and proprietary techniques to integrate all sixty-six drivers in a single cabinet into a single radiating line array for a broad frequency range. In addition to the passive crossover, the DYNA-TECH Plus advanced driver overload protection circuitry is included. Oh, and it sounds good, too!

ENTASYS Low Frequency Column: ENT-LF, ENT-LFW

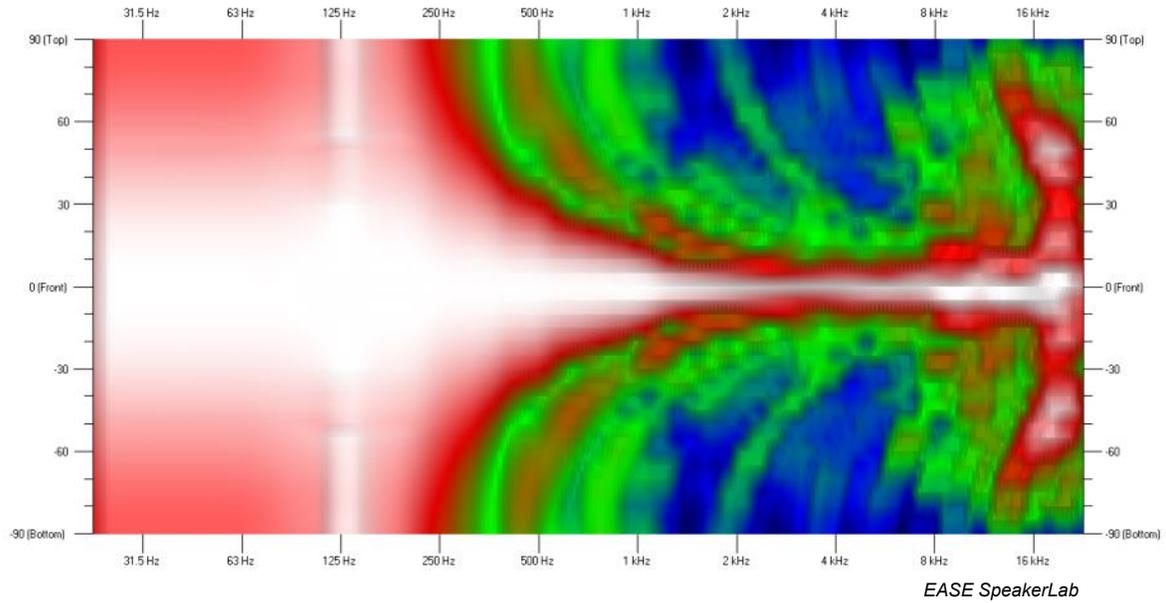
The ENTASYS Low Frequency Column is very similar to the Full-Range Column. In fact, it is almost impossible to distinguish between them from a visual inspection (except for looking at the label on the bottom). The low frequency column uses the same enclosure, grille, input connectors, etc. The only difference is that it does not have any midrange or high frequency drivers or the passive crossover circuitry for these drivers. It does, however, contain its own passive low pass filter, optimized for seamless integration with the Full-Range or other Low Frequency columns in an array. It also employs DYNA-TECH driver overload protection.

The low frequency column is not intended as a low frequency extension device or a subwoofer. It is for use to augment the maximum output level of the low frequency pass band for ENTASYS as well enhancing its directivity control in this frequency region. This is illustrated by comparing the vertical directivity map of a single full-range column (Figures 2) with a full-range and two low frequency columns (Figures 3).

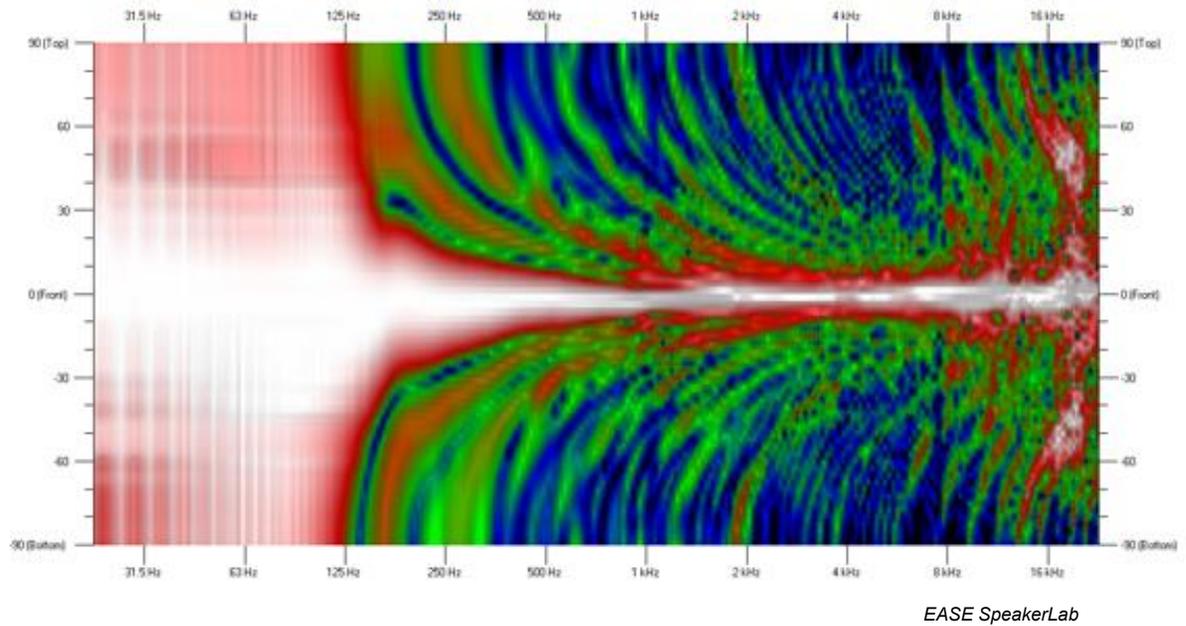
The low frequency column should use the same external high pass filter as the full-range column when multiple columns are employed.

MODELS

Figure 2: Vertical Directivity Map of One ENTASYS Full-Range Column at 50 meters



**Figure 3: Vertical Directivity Map of an ENTASYS Array at 50 meters
(One Full-Range and Two Low Frequency Columns; FR-LF-LF)**



ACCESSORIES

OPTIONAL MOUNTING HARDWARE

ENTASYS loudspeaker enclosures have identical footprints to easily facilitate the construction of seamless arrays. Community offers a wide selection of versatile mounting options for ENTASYS loudspeakers, all of which are designed to attach to the supplied Mounting Bracket. ENTASYS mounting hardware is available in white or black. Detailed installation instructions for each mounting bracket are included with each individual bracket.

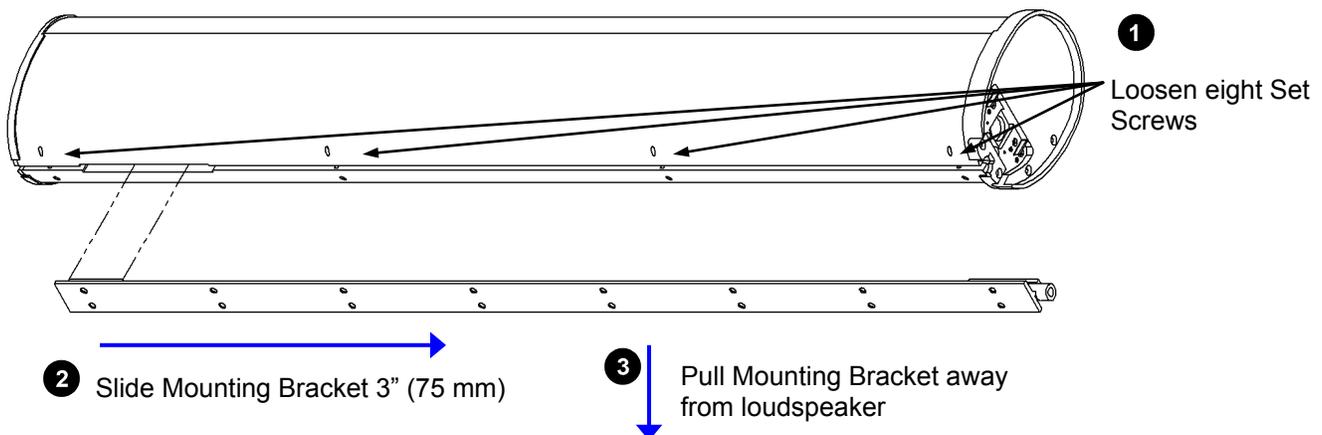
ENTASYS Mounting Bracket (included): ENT-MB, ENT-MBW

The ENTASYS T-Bar Mounting Bracket, sometimes referred to as the “T-bracket”, is included and shipped attached to each ENTASYS column loudspeaker. Designated the ENT-MB, it is the primary means of attaching all other brackets and fly kits to the loudspeaker enclosure. This bracket must be removed from the loudspeaker in order to attach other brackets or fly kits to it. This is most easily accomplished by either laying the ENTASYS loudspeaker on its side or placing it upside down on a level surface. There are eight set screws, four on each side of the rear of the enclosure, that secure this bracket to the enclosure. Once these are sufficiently loosened, the Mounting Bracket may be slid down parallel to the enclosure, as if pulling it away from the bottom of the enclosure, approximately 3 inches (75 mm). It can then be pulled out of the slot and away from the enclosure.

The bracket reattaches to the enclosure exactly as it was removed. Simply reverse the order of the steps shown in **Figure 4**.

Before reattaching the Mounting Bracket make sure the Set Screw is tightened to securely fasten the Bottom Fitting to the Mounting Bracket. Refer to **Figure 1 and Table 1 on Pages 8 and 9** if there is any uncertainty identifying these parts and where they are located.

Figure 4: ENTASYS Mounting Bracket Removal



ACCESSORIES

The “T” Mounting Bracket may be used to attach a single ENTASYS loudspeaker directly to a wall.

Instructions for Attachment

1. Remove the “T” Mounting Bracket from the ENTASYS column to be mounted. See **Figure 4** for instructions on this removal.
2. Attach the “T” Mounting Bracket to the desired location. Extreme care should be used to assure that the correct screws are used for the wall material or other substrate onto which the “T” Mounting Bracket is mounted. As a hypothetical example, a 2x4 wall stud may not yield adequate strength and as a result may split, whereas a 4x4 stud may be sufficient.
3. Use only screws with the proper countersunk heads as detailed in **Figures 5 and 6**. Failure to use the correct size screw head could lead to an unsafe mounting or not allow the ENTASYS enclosure to be placed on the Mounting Bracket. A #12 screw is the largest size screw head that will fit flush in the countersink and not interfere with placing the ENTASYS enclosure on the Mounting Bracket.
4. Use a screw in all sixteen (16) of the hole locations in the “T” Mounting Bracket as shown in **Figure 7**. Failure to do this may lead to an unsafe mounting.

Figure 5: Countersink Detail

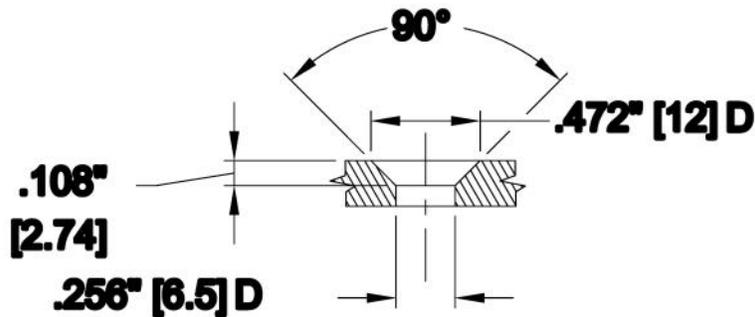
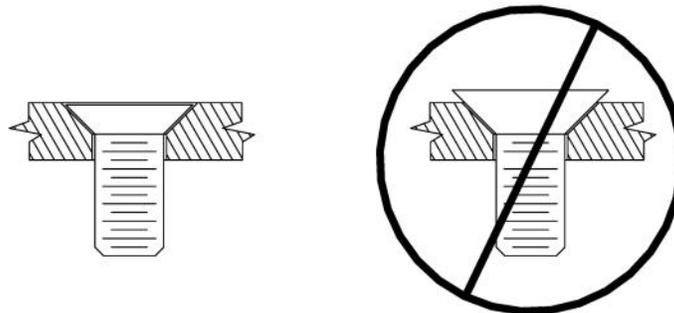


Figure 6: Countersink Screw Head Profile



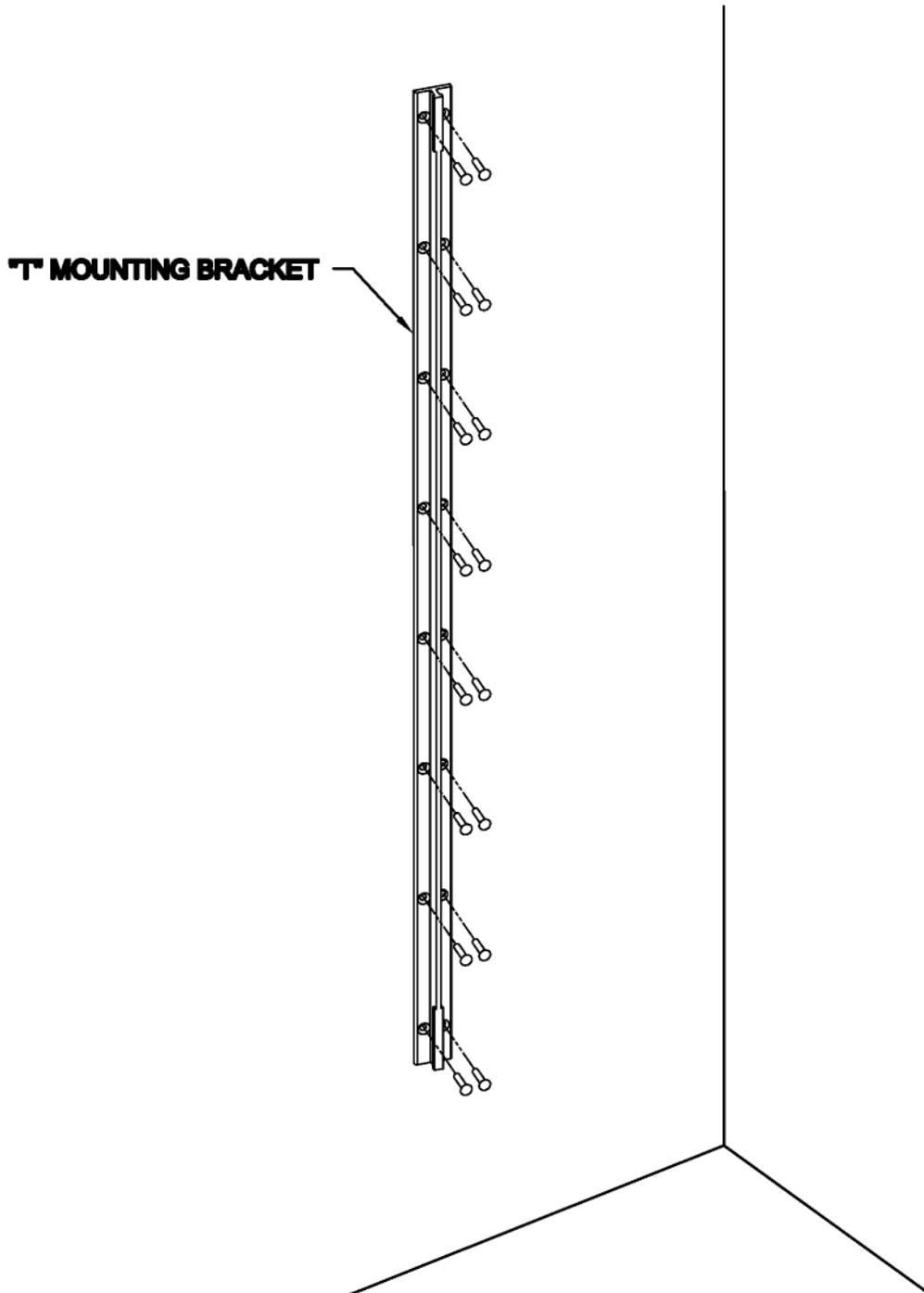
5. Once the “T” Mounting Bracket has been securely mounted, verify that the Bottom Fitting is securely fastened to the bottom of the “T” Mounting Bracket with its M6 Set Screw. This is critical as the entire weight of the loudspeaker must be supported by this single Bottom Fitting.
6. Align the tabs on the “T” Mounting Brackets with the larger opening in the slot on the back of the ENTASYS enclosure. Insert the “T” Mounting Bracket into the mating slot in the enclosure and slide the ENTASYS enclosure down onto the “T” Mounting Bracket and into position. This is done in the same manner as reattaching the “T” Mounting Bracket shown in **Figure 4**.

ACCESSORIES



WARNING: The screws used and wall material onto which the Mounting Bracket is attached must be capable of supporting the load of the ENTASYS loudspeaker to be mounted. It is the responsibility of the installer to verify these items.

Figure 7: Wall Mounted “T” Mounting Bracket



ACCESSORIES

ENTASYS Coupler Bracket: ENT-CB1, ENT-CB2, ENT-CB1W, ENT-CB2W

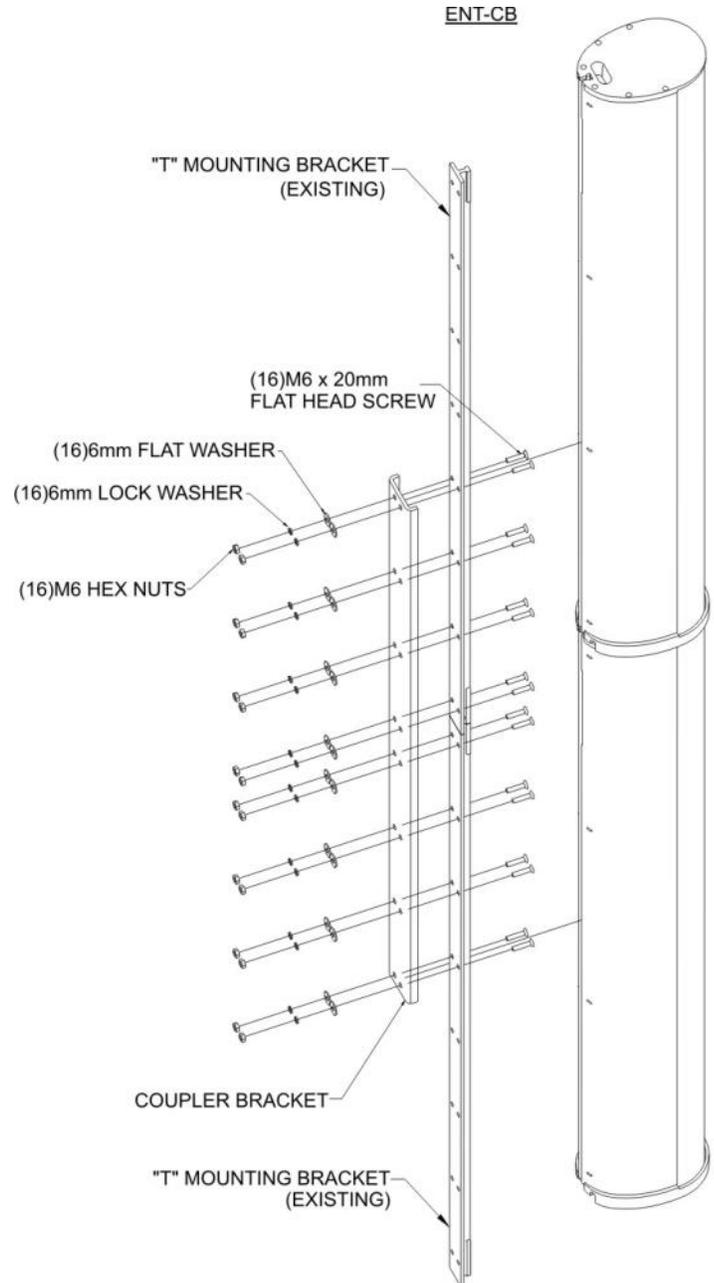
The ENTASYS Coupler Bracket, designated ENT-CB, is used to attach two ENTASYS columns together. Multiple Coupler Brackets may be used to connect up to five columns together. The Coupler Brackets must be attached to the “T” Mounting Bracket from each of the ENTASYS columns that are to be connected together as shown in **Figure 8**.

Connecting the ENTASYS enclosures together is the first step required when constructing multiple column arrays regardless of the other brackets that will be used to mount or suspend them.

Instructions for Attachment

1. Remove the “T” Mounting Brackets from each ENTASYS column to be connected together. See **Figure 4** for instructions on this removal.
2. Bolt the Coupler Bracket to the two “T” Mounting Brackets as shown in **Figure 8** using the M6 x 20mm bolts, flat washers, lock washers, and nuts included with the Coupler Bracket. Note that the “T” Mounting Brackets should lay inside the “U” shape profile of the Coupler Bracket. Verify that the nuts and bolts are securely tightened. Failure to do this may result in unsafe construction of the array.
3. If more than two ENTASYS columns are to be connected together, repeat Step 2 as necessary for connecting up to five “T” Mounting Brackets together.
- 3.5 Note: follow connection instructions on pages 40-41 before permanently stacking two or more ENTASYS.
4. Stack the ENTASYS columns together in the required order for the array to be constructed. This may be done vertically by stacking them on top of each other, or horizontally by laying them on the ground.
5. Align the tabs on the “T” Mounting Brackets with the larger opening in the slot on the back of each ENTASYS enclosure. Insert the “T” Mounting Bracket and Coupler Bracket assembly into the slot in the enclosure and slide the “T” Mounting Bracket and Coupler Bracket assembly up into position in the enclosure slot. This is done in a similar manner as reattaching a single “T” Mounting Bracket (see **Figure 4**).
6. **Make sure the Bottom Fitting is securely fastened to the bottom of the “T” Mounting Bracket and Coupler Bracket assembly with its M6 Set Screw. This is critical as the entire weight of the array must be supported by this single Bottom Fitting.**
7. Tighten all eight of the M4 Set Screws in each ENTASYS enclosure to secure it to its “T” Mounting Bracket (see **Figure 4**).

Figure 8: Coupler Bracket



ACCESSORIES

Refer to **Figure 1 and Table 1 on Pages 8 and 9** if there is any uncertainty identifying these parts and where they are located.

Assembly Tip: Use a C-clamp or locking pliers (vise-grips) to align the ends for the two “T” Mounting Brackets before bolting them to the Coupler Bracket. Leave the clamp in place until all of the screws have been tightened. This will assure proper alignment.



WARNING: Up to four (4) ENTASYS Coupler Brackets may be used to connect up to five (5) ENTASYS loudspeakers together into a single array. Do not attempt to construct a single array or more than five (5) ENTASYS loudspeakers. Attempting to do so will exceed the Working Load Limit of the bracket and could result in the failure of the bracket and potentially result in severe injury and/or loss of life.

ENTASYS Pan Bracket: ENT-PB, ENT-PBW

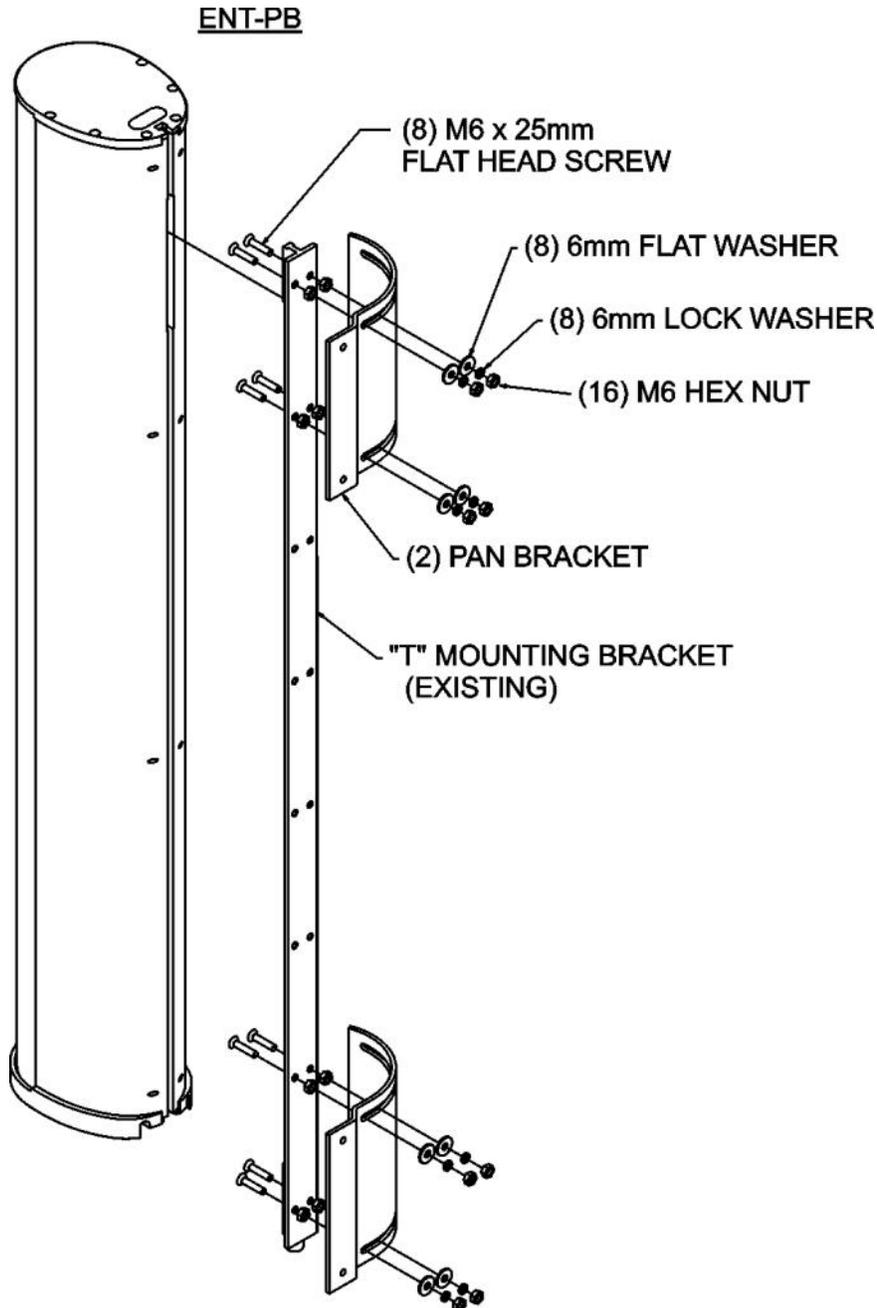
The ENTASYS Pan Bracket, designated ENT-PB, can be used to mount up to five ENTASYS columns flush on a wall while providing a means to rotate the entire array up to 80° (5° - 85° aiming angles) about a vertical axis. The Pan Brackets may be installed on a wall in either a left-hand or right-hand orientation as required for the desired aiming of the array. The Pan Bracket consists of two curved metal brackets and all of the hardware required to attach these brackets to the “T” Mounting Bracket.

Instructions for Attachment (see Figure 9)

1. Remove the “T” Mounting Bracket from the ENTASYS column to be mounted using the Pan Bracket. See **Figure 4** for instructions on this removal. If multiple columns are to be mounted using a Pan Bracket see the instructions for attaching the columns using the Coupler Bracket on **Page 20**.
2. Securely fasten eight of the M6 bolts and nuts to the “T” Mounting Bracket using four in the upper most portion of the “T” Mounting Bracket and four in the lower most portion of the “T” Mounting Bracket. This will yield eight mounting studs for the Pan Brackets. Do this before attaching either of the Pan Brackets or the washers to the “T” Mounting Bracket.
3. Attach one of the Pan Brackets to the upper most studs on the “T” Mounting Bracket and the other Pan Bracket to the lower most studs on the “T” Mounting Bracket using the flat washers, lock washers, and remaining nuts. Tighten the nuts securely.
4. Place the “T” Mounting Bracket and Pan Bracket assembly on the wall where the ENTASYS array is to be installed. Mark the positions on the wall where the holes in the Pan Bracket are located.
5. Remove the “T” Mounting Bracket and Pan Bracket assembly from the wall and properly prepare the wall to accept the correct type of bolts with which to attach the Pan Bracket assembly to the wall.
6. Attach the “T” Mounting Bracket and Pan Bracket assembly to the wall using the proper bolts for the wall material and the weight of the ENTASYS array to be mounted.
7. Loosen the eight M6 nuts between the Pan Bracket and the wall (not the nuts between the “T” Mounting Bracket and the Pan Bracket) and rotate the “T” Mounting Bracket to its approximate desired aiming location and retighten the nuts.
8. Align the tabs on the “T” Mounting Bracket with the larger opening in the slot on the back of the ENTASYS enclosure. Insert the “T” Mounting Bracket into the slot in the enclosure and slide the enclosure down onto the “T” Mounting Bracket until it is resting on the Bottom Fitting. This is done in a similar manner as reattaching a single “T” Mounting Bracket (see **Figure 4**).
9. Tighten the eight M4 Set Screws on the ENTASYS enclosure to secure it to the “T” Mounting Bracket.

ACCESSORIES

Figure 9: Pan Bracket



10. When the enclosure is in position, the eight M6 nuts between the Pan Bracket and the wall may be loosened and the array rotated in the Pan Bracket to the final desired aiming position. Once the array is aimed as desired, the eight M6 nuts must be securely tightened to keep the array in position and have a safe mounting.
11. If multiple ENTASYS columns are to be mounted in an array with the Pan Bracket, first connect the individual T-Bar Mounting Brackets using the appropriate number of ENTASYS Coupler Brackets and perform Step #6 by attaching the entire T-Bar Mounting Bracket and Pan Bracket assembly to the wall. Slide the individual ENTASYS enclosures down onto the T-Bar Mounting Bracket as described in Step #8, starting with the lowermost enclosure. **Make sure the Bottom Fitting is securely fastened to the bottom of the T-Bar Mounting Bracket and Coupler Bracket assembly with its M6 Set Screw. This is critical as the entire weight of the array must be supported by this single Bottom Fitting.** The upper enclosures will not rest on the Bottom Fitting, but instead will rest on the ENTASYS enclosure directly below it.

ACCESSORIES



WARNING: The bolts used and wall material into which the Pan Bracket assembly is bolted must be capable of supporting the load of the ENTASYS array to be mounted. It is the responsibility of the installer to verify these items.



WARNING: A pair of ENTASYS Pan Brackets must not be used to support more than five (5) ENTASYS loudspeakers. Attempting to do so will exceed the Working Load Limit of the bracket and could result in the failure of the bracket and potentially result in severe injury and/or loss of life.

ENTASYS Pan-Tilt Bracket: ENT-PT, ENT-PTW

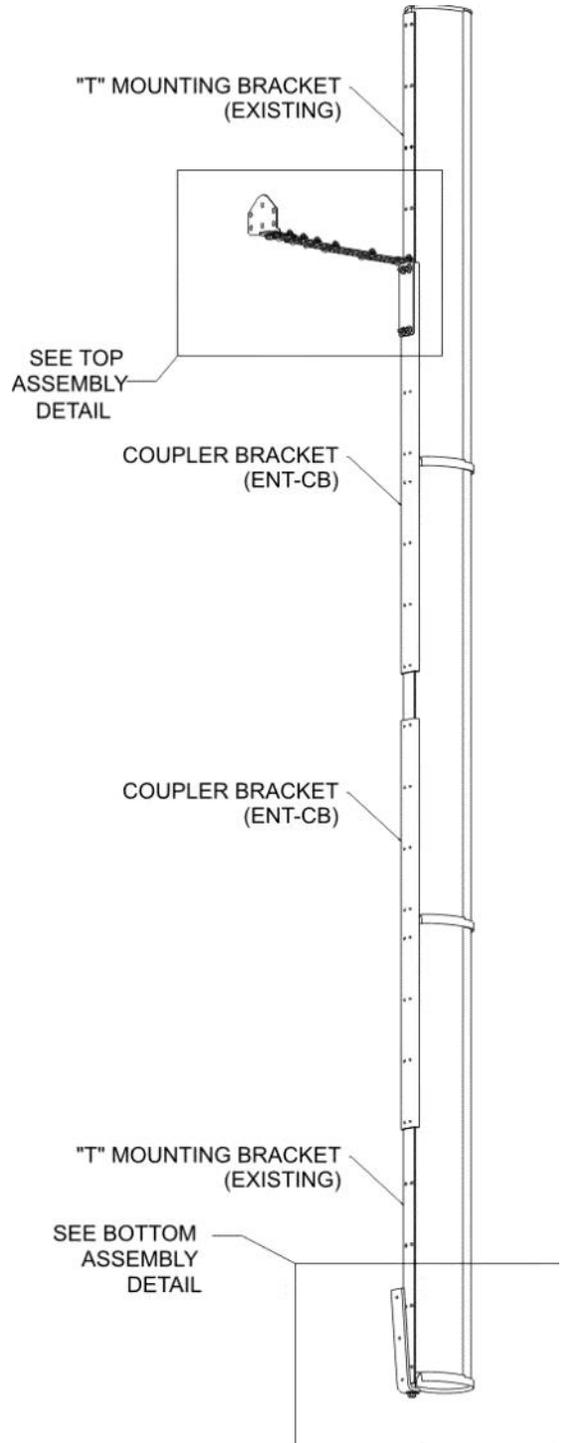
The ENTASYS Pan-Tilt Bracket, designated ENT-PT, is used to provide a down-tilt angle (rotation about a horizontal axis) and a panning action (rotation about a vertical axis) when an array is mounted to a wall. The Pan-Tilt Bracket consists of two primary parts, a Top Assembly and a Bottom Piece, as shown in **Figures 11 and 12**. The Top Assembly consists of multiple parts that are configured and assembled to yield the desired down angle for an array of up to five columns. After the Pan-Tilt Bracket Assembly is put together it is mounted to a wall and then the ENTASYS loudspeaker(s) are attached to it.

The Pan-Tilt bracket can be used with a one, two, or three column array for a down-tilt angle of up to 10°. With a four or five column array the maximum down-tilt angle is 5°.

Instructions for Attachment (see Figure 11)

1. Remove the “T” Mounting Bracket from the ENTASYS column to be mounted. See **Figure 4** for instructions on this removal. If multiple columns are to be mounted using a Pan-Tilt Bracket see the instructions for attaching the columns using the Coupler Bracket on **Page 18**.
2. For a single loudspeaker array, securely fasten four of the M6 x 30mm bolts and nuts to the “T” Mounting Bracket in the top four holes of the “T” Mounting Bracket. For a multiple loudspeaker array, securely fasten the four M6 x 30mm bolts and nuts to the top four holes in the top Coupler Bracket and “T” Mounting Bracket (Note that screws currently in these holes in the Coupler Bracket must be removed first). This will yield four mounting studs for the Top Angle Bracket. Do this before attaching any other parts of the Pan-Tilt Bracket or the washers to the “T” Mounting Bracket.
3. Attach the Top Angle Bracket to the four mounting studs using the four M6 nuts, lock washers, and flat washers. Tighten these nuts securely.
4. Attach the Top Wall Bracket to the Small Extension Bracket using the M10 x 25mm bolt, flat washer, lock washer, and nut. Be sure to place the Locking Bar into position during this step. Only finger tighten the M10 bolt and nut.

Figure 10: Pan-Tilt Bracket on Multiple Columns



ACCESSORIES

Figure 11: Pan-Tilt Bracket - Top Assembly

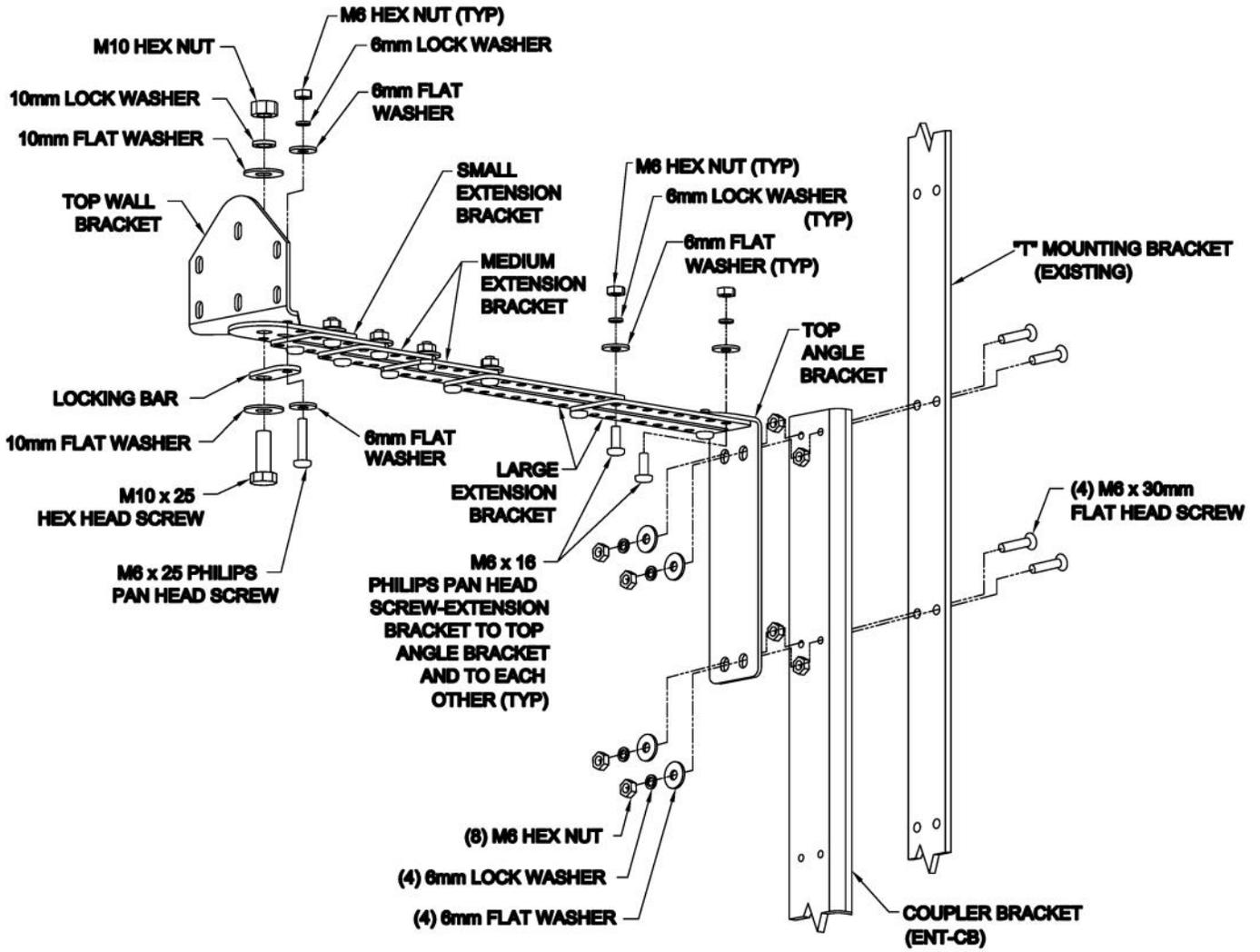
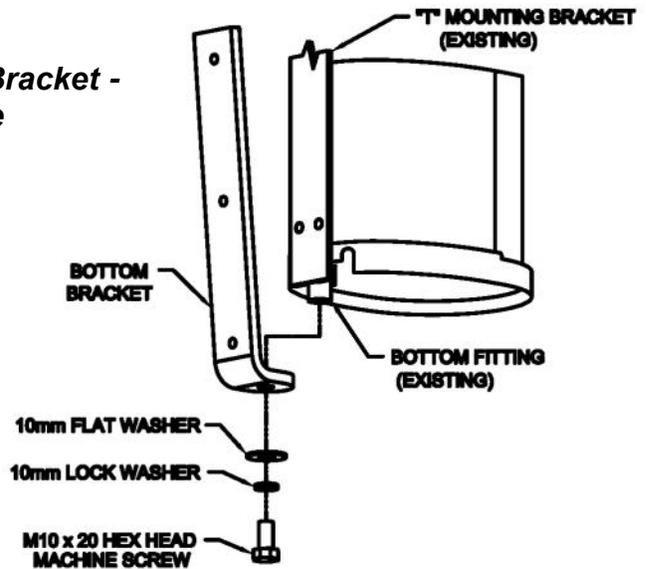


Figure 12: Pan-Tilt Bracket - Bottom Piece



ACCESSORIES

5. Attach the Medium and Large Extension Brackets to the Small Extension Bracket as needed to achieve the correct length for the desired down-tilt angle. Use the M6 x 16mm Pan Head Screws, flat washers, lock washers, and nuts. Tighten securely. See **Tables 2 to 6** on the following pages for details on which Extension Brackets to use for a particular array size and down-tilt angle. Use the fewest number of Extension Brackets possible to achieve the correct total length. Be sure to attach additional Extension Brackets below the previous Extension Bracket as they progress away from the Small Extension Bracket.
6. Insert the M6 x 25mm screw, flat washer, lock washer, and nut into position in the Locking Bar and Top Wall Bracket and tighten.
7. Attach the Extension Bracket assembly to the Top Angle Bracket using M6 x 16mm screws, flat washers, lock washers, and nuts. Tighten securely.
8. Attach the Bottom Bracket to the Bottom Fitting at the bottom of the “T” Mounting Bracket using the M10 x 20mm bolt, lock washer, and flat washer.
9. Place the Pan-Tilt Bracket assembly on the wall where the ENTASYS array is to be installed. Mark the positions on the wall where the holes in the Pan-Tilt Bracket are located.
10. Remove the Pan-Tilt Bracket assembly from the wall and properly prepare the wall to accept the correct type of bolts with which to attach the Pan Bracket assembly to the wall.
11. Attach the Pan-Tilt Bracket assembly to the wall using the proper bolts for the wall material and the weight of the ENTASYS array to be mounted.
12. Slide the bottom ENTASYS loudspeaker onto the “T” Mounting Bracket. Tighten all eight of the M4 Set Screws on the ENTASYS enclosure. Place each additional ENTASYS enclosure on the “T” Mounting Bracket in the desired order. Tighten all eight of the M4 Set Screws for an enclosure before another ENTASYS enclosure is placed on top of it. Any Dual Banana Plug Jumpers should be placed into position during this step.
13. Loosen the M6 screw on the outside portion of the Locking Bar. This will allow the array to pivot to point toward the desired location. Aim the array and then tighten the M6 screw on the Locking Bar.
14. Securely tighten the M10 bolts on the Top Wall Bracket and the Bottom Bracket.

A bracket cover is also provided to help maintain a cosmetically appealing installation. This cover consists of two pieces of black or white PVC extrusion. These should each be cut to the required length and then placed above and below the Extension Bracket assembly as shown in **Figure 13**. The two pieces of extrusion will snap together to enclose the Extension Bracket assembly and hide the hardware.

Assembly Tip: If it is difficult to determine the exact downward aiming angle required for a specific application, the Extension Brackets may be temporarily assembled with a single nut and bolt placed in the center slot of the Extension Brackets. This will help to more quickly determine the required angle without having to disassemble the Extension Brackets when changing the downward aiming angle. Once the desired downward aiming angle has been determined, assemble the Extension Brackets using the nearest sets of holes along the sides of the Extension Brackets.



WARNING: Never use the center slot of an Extension Bracket for the permanent assembly of this kit.



WARNING: A single ENTASYS Pan-Tilt Bracket assembly must not be used to support more than five (5) ENTASYS loudspeakers. Attempting to do so will exceed the Working Load Limit of the bracket and could result in the failure of the bracket and potentially result in severe injury and/or loss of life.

ACCESSORIES

Table 2: One ENTASYS Column Down Angles

One ENTASYS Column Loudspeaker		
Extension Brackets	Holes	Angle
Small	-	4.7
1x Medium	1	5.4
	2	6.2
	3	7.0
	4	7.7
1x Large	5	8.5
	6	9.2
	7	9.9
	8	NA

Table 3: Two ENTASYS Column Down Angles

Two ENTASYS Column Loudspeakers		
Extension Brackets	Holes	Angle
Small	-	3.2
1x Medium	1	3.7
	2	4.2
	3	4.8
	4	5.3
1x Large	5	5.8
	6	6.3
	7	6.8
	8	7.4
1x Medium + 1x Large	9	7.9
	10	8.4
	11	8.9
	12	9.4
2x Large	13	9.9
	14	NA
	15	NA
	16	NA

Table 4: Three ENTASYS Column Down Angles

Three ENTASYS Column Loudspeakers		
Extension Brackets	Holes	Angle
Small	-	1.9
1x Medium	1	2.2
	2	2.5
	3	2.8
	4	3.1
1x Large	5	3.5
	6	3.8
	7	4.1
	8	4.4
1x Medium + 1x Large	9	4.7
	10	5.0
	11	5.3
	12	5.6
2x Large	13	5.9
	14	6.2
	15	6.5
	16	6.9
1x Medium + 2x Large	17	7.2
	18	7.5
	19	7.8
	20	8.1
2x Medium + 2x Large	21	8.4
	22	8.7
	23	9.0
	24	9.3
3x Medium + 2x Large	25	9.6
	26	9.9
	27	NA
	28	NA

ACCESSORIES

Table 5: Four ENTASYS Column Down Angles

Four ENTASYS Column Loudspeakers		
Extension Brackets	Holes	Angle
Small	-	1.4
1x Medium	1	1.6
	2	1.8
	3	2.0
	4	2.2
1x Large	5	2.5
	6	2.7
	7	2.9
	8	3.1
1x Medium + 1x Large	9	3.3
	10	3.6
	11	3.8
	12	4.0
2x Large	13	4.2
	14	4.4
	15	4.7
	16	4.9

Table 6: Five ENTASYS Column Down Angles

Five ENTASYS Column Loudspeakers		
Extension Brackets	Holes	Angle
Small	-	1.1
1x Medium	1	1.2
	2	1.4
	3	1.6
	4	1.7
1x Large	5	1.9
	6	2.1
	7	2.3
	8	2.4
1x Medium + 1x Large	9	2.6
	10	2.8
	11	2.9
	12	3.1
2x Large	13	3.3
	14	3.5
	15	3.6
	16	3.8
1x Medium + 2x Large	17	4.0
	18	4.1
	19	4.3
	20	4.5
2x Medium + 2x Large	21	4.7
	22	4.8
	23	5.0
	24	NA

Tables 2 to 6 indicate the number of holes in an Extension Bracket that should extend past the Small Extension Bracket to the Top Angle Bracket to achieve the listed down angle. When attaching the Small Extension directly to the Top Angle Bracket there are no extra Extension Bracket holes.

The Top Angle Bracket will attach to the last of these holes that extend past the Small Extension Bracket. In other words, the holes to which the Top Angle Bracket is attached must be counted as one of the holes listed in the "Holes" column in these tables.



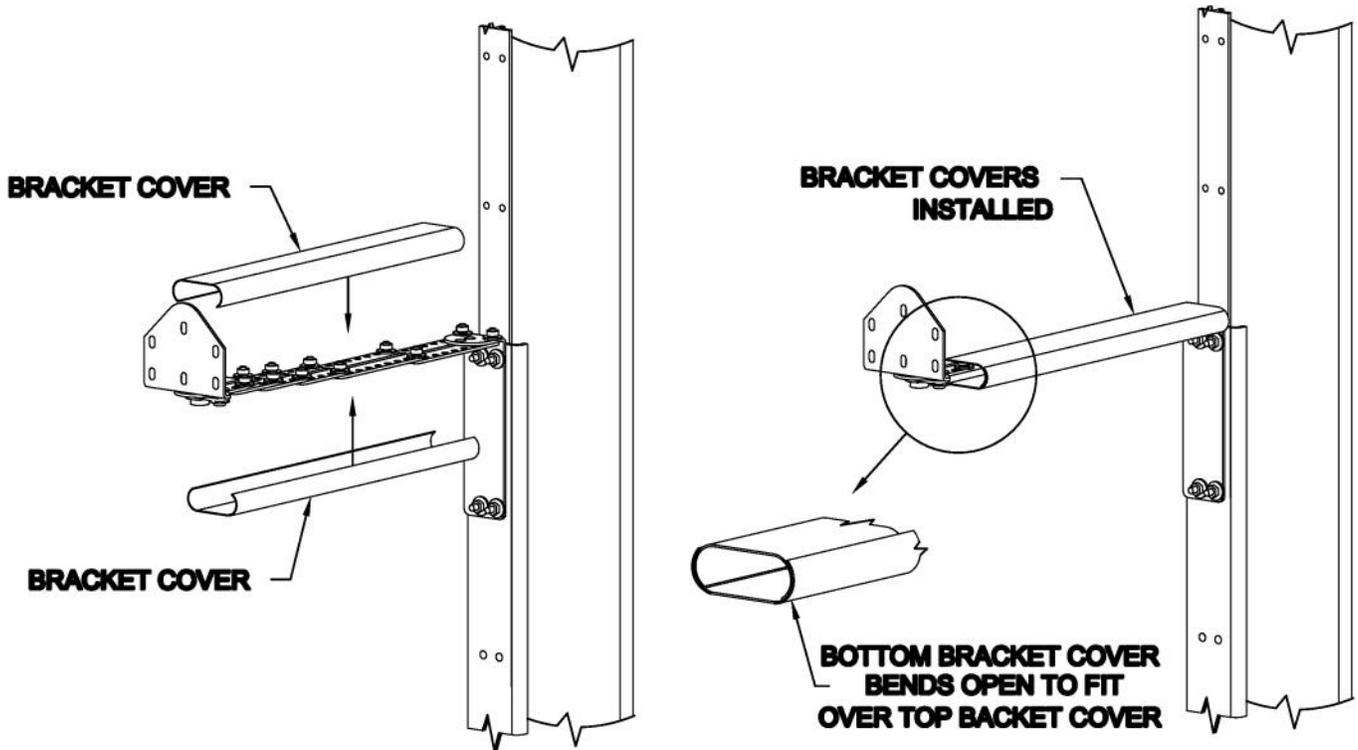
WARNING: Do not extend ENTASYS arrays beyond a 10° down angle for a one, two, or three column array or beyond a 5° down angle for a four or five column array. Attempting to do so will exceed the Working Load Limit of the bracket and could result in the failure of the bracket and potentially result in severe injury and/or loss of life.



WARNING: The bolts used and wall material into which the Pan Bracket assembly is bolted must be capable of supporting the load of the ENTASYS array to be mounted. It is the responsibility of the installer to verify these items.

ACCESSORIES

Figure 13: Pan-Tilt Bracket - Cover Assembly



ENTASYS Fly Kit: ENT-FK, ENT-FKW

The ENTASYS Fly Kit (**Figure 14**) can be used to suspend an array of up to five ENTASYS modules. The Fly Bracket provides multiple attachment points at the top of an array while the Pull Back Bracket provides points lower on the array for additional aiming flexibility. While the attachment points on the Fly Bracket at the top of an array alone will allow various down-tilt angles with a dead hang, this point alone is not recommended. The attachment points on the Pull Back Bracket at the bottom of an array should also be used for fine control of vertical tilt. Use both points: the Fly Bracket plus the Pull Back Bracket. Attach a secondary safety line to the top of the Fly Bracket as a safety cable.

Instructions for Attachment (see Figure 14)

1. Remove the “T” Mounting Bracket from the ENTASYS column to be mounted using the Fly Kit. See **Figure 4** for instructions on this removal. If multiple columns are to be mounted using a Fly Kit see the instructions for attaching the columns using the Coupler Bracket in **Figure 8**.
2. Securely fasten the four M6 x 25mm bolts and nuts to the top four holes in the “T” Mounting Bracket. This will yield four mounting studs for the Fly Bracket. Do not use any washers at this point.
3. Securely fasten the four M6 x 30mm bolts and nuts to the four holes in the “T” Mounting Bracket at the desired location for the Pull Back Bracket. This will yield four mounting studs for the Pull Back Bracket. Do not use any washers at this point. These can be placed in any position along the spine of the array. If more than one ENTASYS loudspeaker is used in an array the strongest construction results will be obtained when the Pull Back Bracket is attached through a Coupler Bracket.

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4. Slide the “T” Mounting Bracket into the ENTASYS enclosure(s). Securely tighten each of the eight M4 Set Screws in each ENTASYS enclosure to attach the “T” Mounting Bracket to the enclosure(s).
5. Insert the Rubber Plug into the Dual Banana Plug Thru Connector recess.
6. Attach the Fly Bracket to the upper most studs on the “T” Mounting Bracket using the M6 nuts, lock washers, and flat washers provided. Hand tighten the nuts, then securely tighten the two nuts at the top of the Fly Bracket first. This will compress the Rubber Plug if there is any interference and properly seat the Fly Bracket. Now tighten the two nuts at the bottom of the Fly Bracket.
7. Bolt both halves of the Pull Back Bracket to the lower most studs on the “T” Mounting Bracket using the M6 nuts, lock washers, and flat washers. Securely tighten all four of the nuts.

The ENTASYS array should now be ready to be suspended. Use safe rigging practices when attaching all other rigging hardware to the Fly Kit brackets and to the suspension points of the building or other suspension means.

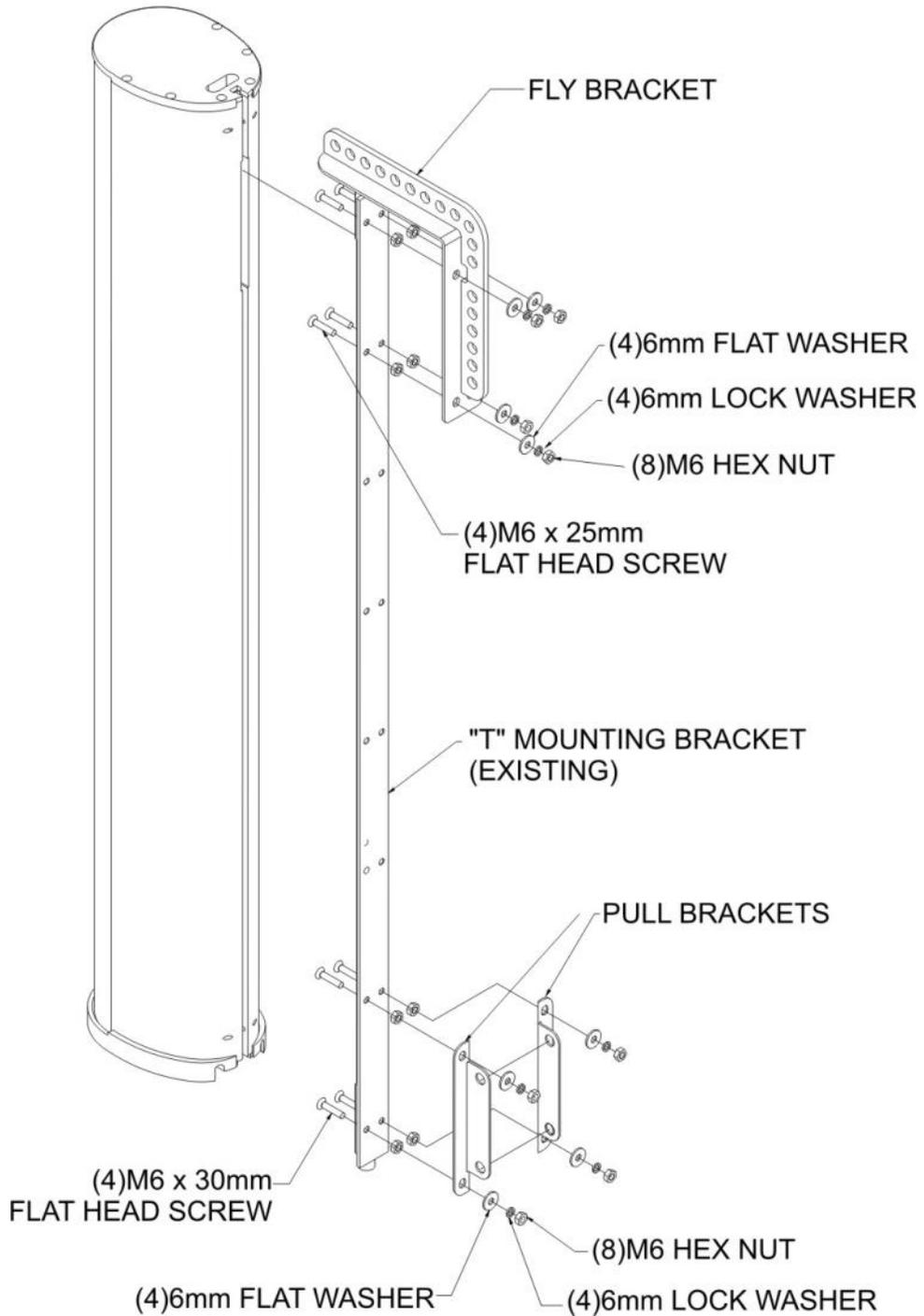


WARNING: A single ENTASYS Fly Kit assembly must not be used to suspend more than five (5) ENTASYS loudspeakers. Attempting to do so will exceed the Working Load Limit of the bracket and could result in the failure of the bracket and potentially result in severe injury and/or loss of life.

ACCESSORIES

Figure 14: Fly Kit

ENT-FK



ACCESSORIES

OPTIONAL TRANSFORMER

ENTASYS 750 Watt Autoformer: ENT-750T, ENT-750TW

The ENTASYS 750-watt autoformer is a step down auto-transformer for use in constant voltage distribution systems. Designated the **ENT-750T**, it can be used to minimize the I^2R losses of long cable runs by converting the distributed high voltage, low current signal to a lower voltage, higher current signal that can effectively drive the ENTASYS loudspeaker systems.

Included with and shipped attached to the 750W Autoformer is a mounting bracket ("T"-bracket). This is similar to, but shorter than, the mounting bracket supplied with ENTASYS loudspeakers. This bracket may be used to mount the transformer directly to a wall as shown in **Figure 15**. This is the only way to mount the transformer if it is to be placed below an ENTASYS array. The transformer may be electrically connected to the ENTASYS array using the barrier strip terminals on the top of the transformer. When this mounting is used the included Rubber Plug should be inserted into the bottom dual banana jack recess area to seal it from moisture (**Figure 16**).

The transformer may be mechanically attached to the top of an array using the Joiner Bar and the associated hardware that is included with the transformer. This attachment method is shown in **Figure 17**. Mounting the transformer in this manner allows the output of the transformer to be routed to the input of the ENTASYS array via the dual banana jumper plug, also included with the transformer.

Figure 15: Transformer Mounting Below Array

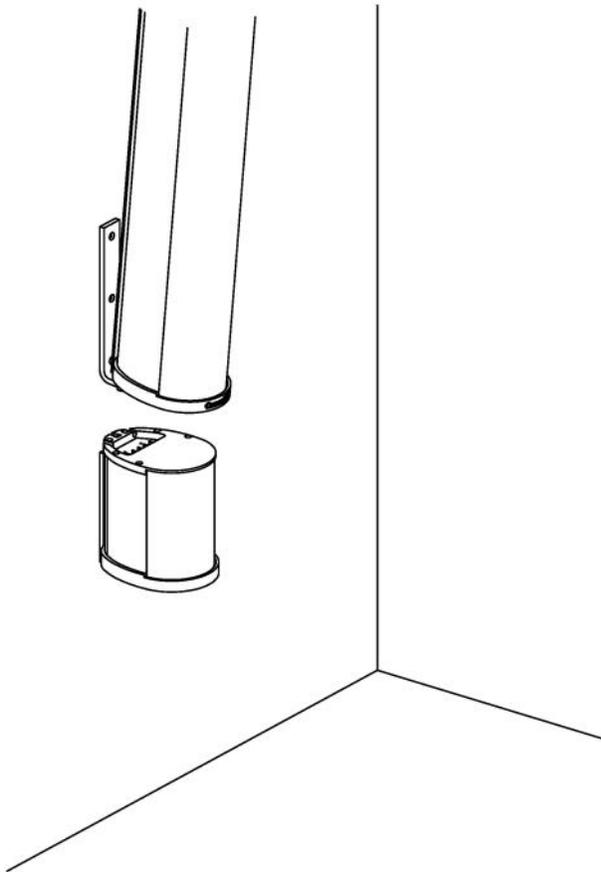
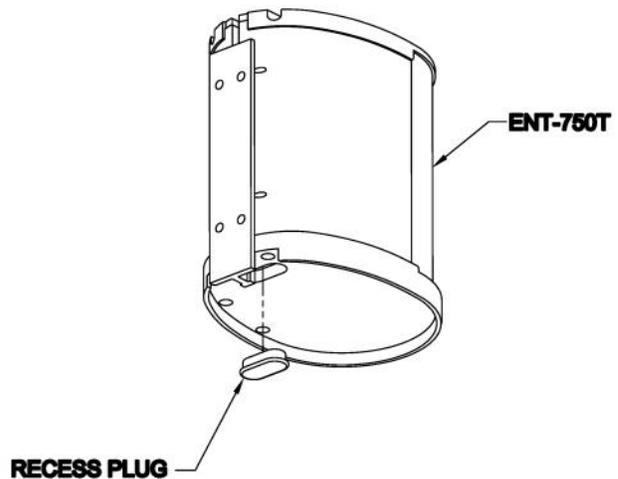


Figure 16: Transformer Recess Plug



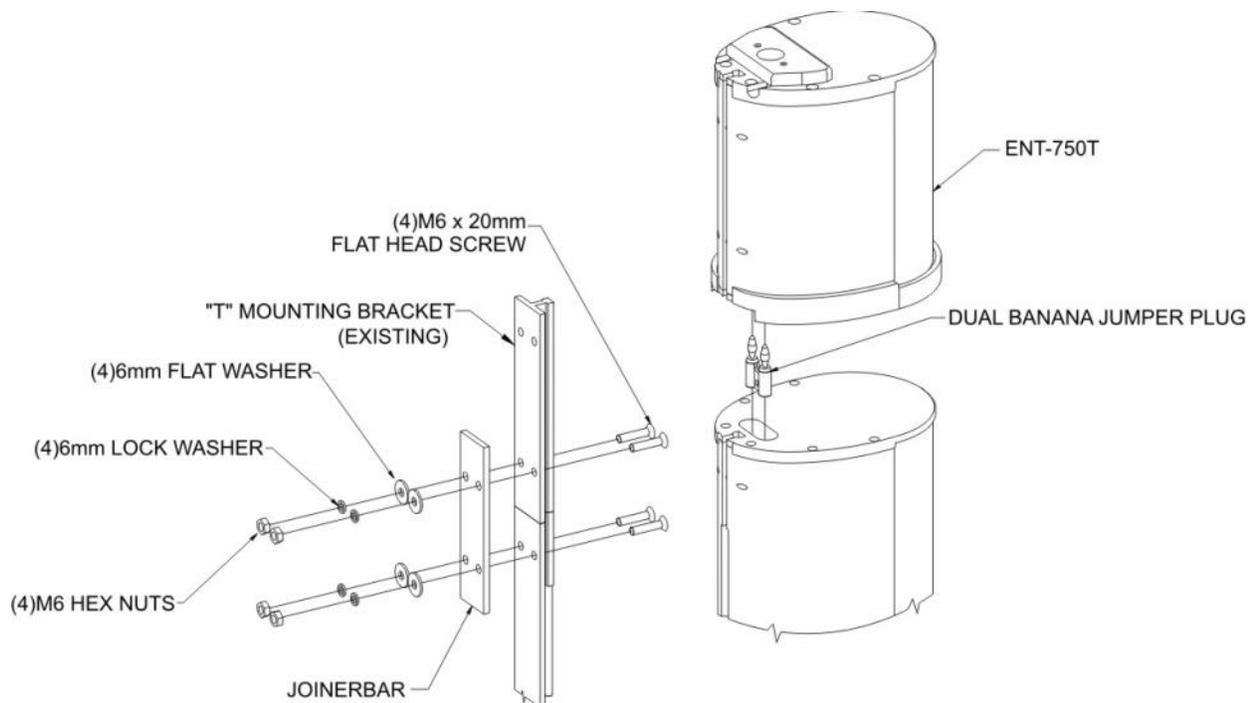
ACCESSORIES

The input wires to the transformer are then attached to the barrier strip terminal. Note the proper terminals to which the input wires should be connected to yield the desired maximum drive level to an ENTASYS array comprised of one, two, or three columns. This information is printed on the input label of the transformer and is shown in **Figure 18**. Once all of the wires are connected to the transformer the Input Panel Cover may be attached to the transformer. This will help protect the input connections from moisture and debris.



WARNING: Never attempt to attach an ENT-750T to the bottom of an ENTASYS loudspeaker. It is NOT strong enough to support the weight of the loudspeaker(s) column above it.

Figure 17: Transformer Mounting On Top of Array



RECOMMENDED LOW FREQUENCY LOUDSPEAKERS

The performance goals and design of the ENTASYS loudspeaker systems inherently limits their low frequency extension. When frequency response below 200 Hz is required additional low frequency loudspeakers and/or subwoofers should be used. Community has several high quality, low frequency loudspeaker systems that are recommended for use with ENTASYS. These include the Versatile Low Frequency (VLF) Series, VERIS subwoofers, and the iLF218.

The VERIS subwoofers are ideal mates for ENTASYS. The VERIS 210S, dual 10-inch, or 212S, dual 12-inch, can provide low frequency extension to approximately 45 Hz.

The Versatile Low Frequency (VLF) Series loudspeakers will also work well with ENTASYS when space considerations restrict the size of the loudspeaker enclosures. The dual 8-inch VLF208 can extend system response to 60 Hz while the dual 12-inch VLF 212 can extend system response to 43 Hz, albeit at slightly lower maximum output levels.

ACCESSORIES

When high SPL is required the iLF218, dual 18 inch system, provides high output at low frequencies down to approximately 40 Hz.

The VLF series and VERIS loudspeakers also feature DYNA-TECH overload protection circuitry to prevent system damage.

Recommended crossover filter settings for use with these Community subwoofers are given in **Table 7**.

Table 7: Recommended Crossover Filter Settings

Model	ENTASYS	VLF208	VLF212	VERIS 210S	VERIS 212S	iLF218
HP Filter	BU	BU	BU	BU	BU	BU
HP Slope	24 dB/oct	48 dB/oct	48 dB/oct	24 dB/oct	24 dB/oct	24 dB/oct
HP Freq.	200 Hz	55 Hz	42 Hz	60 Hz	45 Hz	31 Hz
LP Filter	-	BU	BU	BU	BU	BU
LP Slope	-	24 dB/oct	24 dB/oct	24 dB/oct	24 dB/oct	24 dB/oct
LP Freq.	-	200 Hz	200 Hz	190 Hz	180 Hz	185 Hz
Polarity	Normal	Normal	Normal	Normal	Normal	Normal
EQ Filter 1	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ
Frequency	350 Hz	58 Hz	45 Hz	70 Hz	80 Hz	35 Hz
Bandwidth	0.30	0.20	0.19	0.33	0.21	0.38
Level	-5.0 dB	+9.0 dB	+4.0 dB	+3.5 dB	-7.0 dB	+5.0 dB
EQ Filter 2	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ
Frequency	604 Hz	70 Hz	62 Hz	220 Hz	244 Hz	35 Hz
Bandwidth	0.80	0.33	0.50	0.40	0.33	0.33
Level	-4.5 dB	+5.5 dB	-3.0 dB	-9.0 dB	-14.0 dB	+5.0 dB
EQ Filter 3	PEQ	PEQ	PEQ	-	-	PEQ
Frequency	1.2 kHz	110 Hz	110 Hz	-	-	169 Hz
Bandwidth	0.70	1.00	1.00	-	-	0.50
Level	-4.0 dB	-2.0 dB	+1.0 dB	-	-	-10.0 dB
EQ Filter 4	PEQ	PEQ	PEQ	-	-	PEQ
Frequency	5.7 kHz	248 Hz	200 Hz	-	-	581 Hz
Bandwidth	0.40	0.33	0.33	-	-	0.33
Level	-2.0 dB	-7.0 dB	-7.0 dB	-	-	-6.0 dB

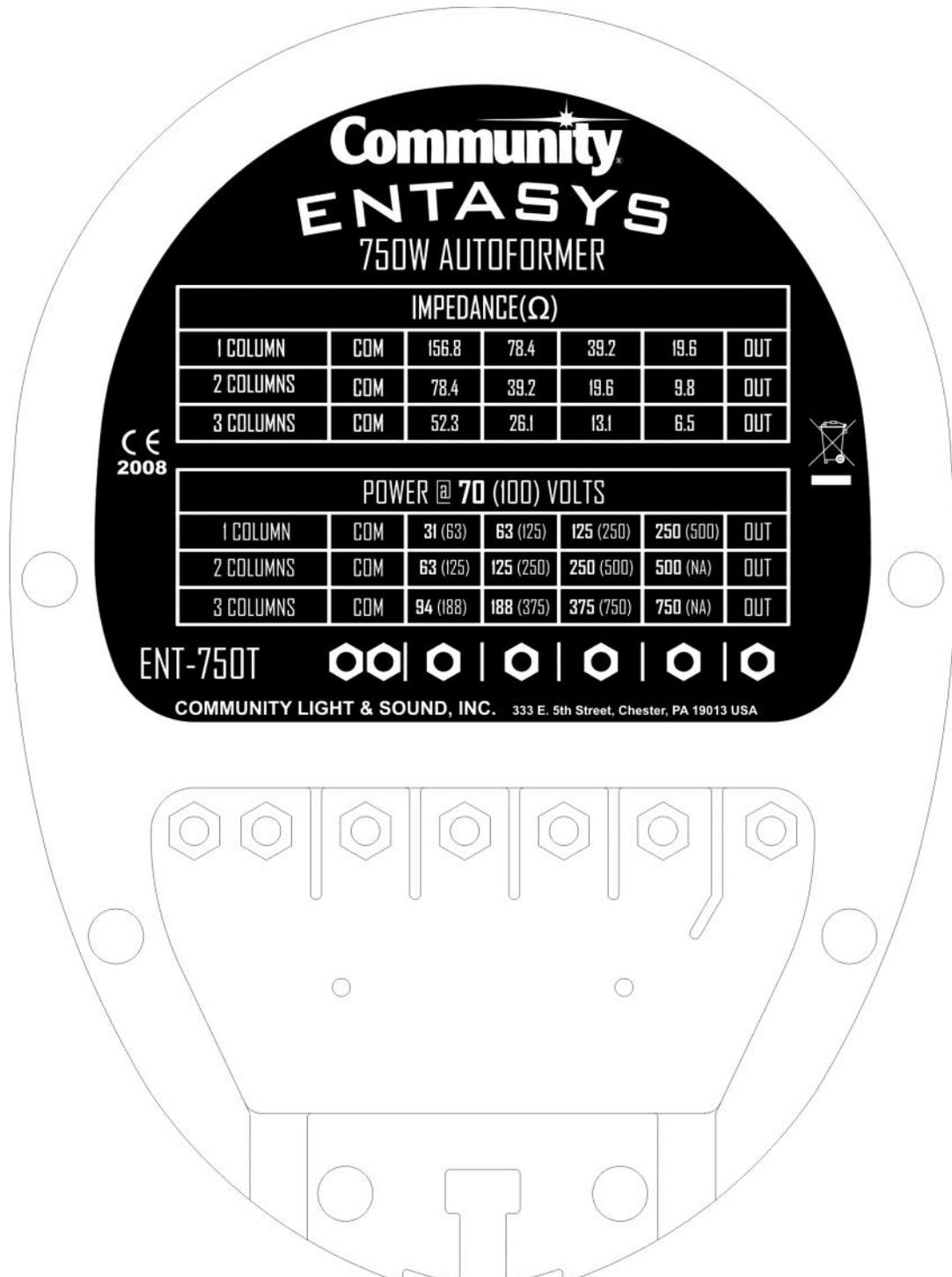
HP = High Pass Filter
 LP = Low Pass Filter
 PEQ = Parametric EQ

BU = Butterworth
 LR = Linkwitz-Riley

Filter Bandwidth is given in percent of an octave, not Q

ACCESSORIES

Figure 18: ENT-750T Transformer Input Label and Connectors



INSTALLATION

ELECTRICAL INSTALLATION AND SAFETY



DANGER: The output voltage and current of audio power amplifiers are a shock hazard. To minimize the risk of electric shock from loudspeaker connecting cables, confirm that the power amplifiers are turned "off" before connecting any loudspeaker cable to the loudspeaker or amplifier. Always follow local electrical codes and proper electrical safety procedures.

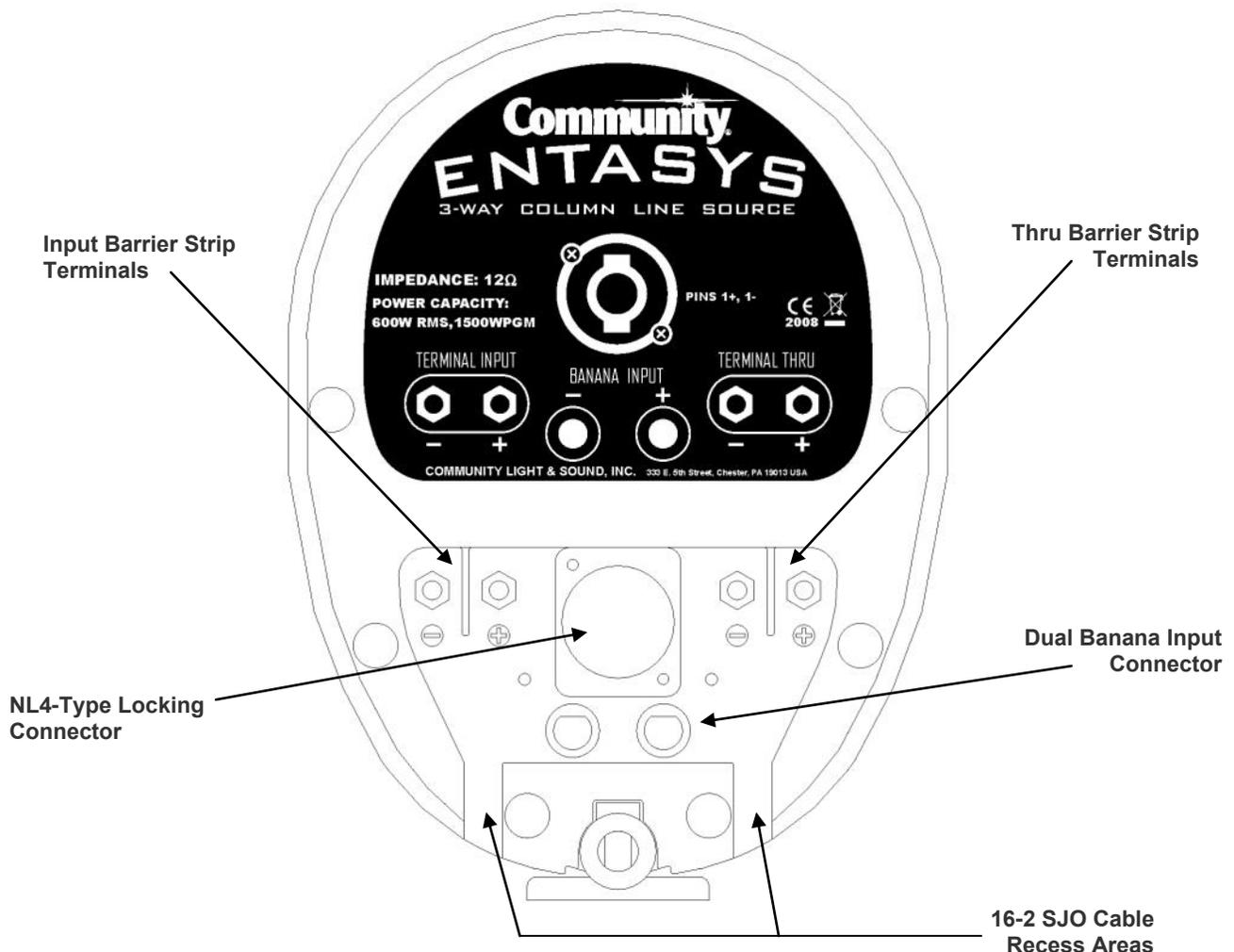
Connections

ENTASYS loudspeakers are equipped with three methods of connecting input signal wires. One is an industry standard NL4-type locking connector. The second is a standard dual banana jack connector. The third is a two position barrier strip terminal. All of these connectors are wired in parallel.

Provisions are also made to pass the input signal through the loudspeaker so that it may be easily routed to other loudspeakers. This can be accomplished two ways. The first is the two position barrier strip thru terminals. The other is the recessed dual banana plug connector located on the top of the loudspeaker enclosure. These connectors are also wired parallel with the input connectors.

Figures 19 and 20 show the input panel for full-range and low frequency ENTASYS loudspeakers.

Figure 19: ENTASYS Full-Range Column Input Panel



INSTALLATION

The connectors located on the bottom of the ENTASYS loudspeaker enclosure are in a recessed area. Relief areas leading into and out of this area through the rear of the enclosure allow for cables up to size 16-2 SJO. A bottom cover panel is provided to seal this area when using the barrier strip terminals. This improves the weather-resistant nature of the enclosure. The bottom cover has a knock out for a 1/2 inch NPT fitting. This allows cables larger than 16-2 SJO to be used or conduit attached to the loudspeaker while sealing the connector area from the elements.

Figure 20: ENTASYS Low Frequency Column Input Panel

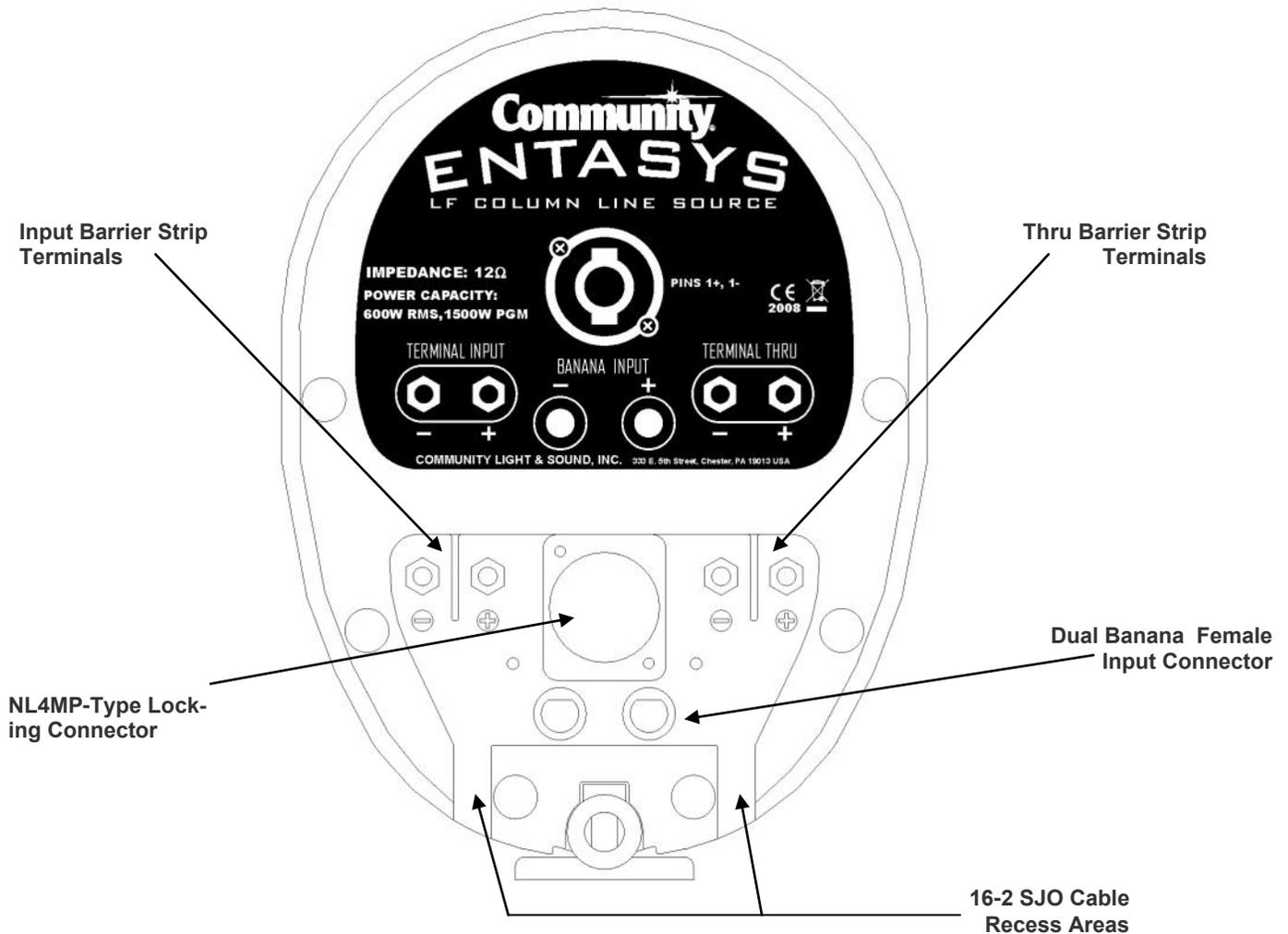
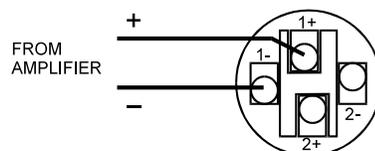
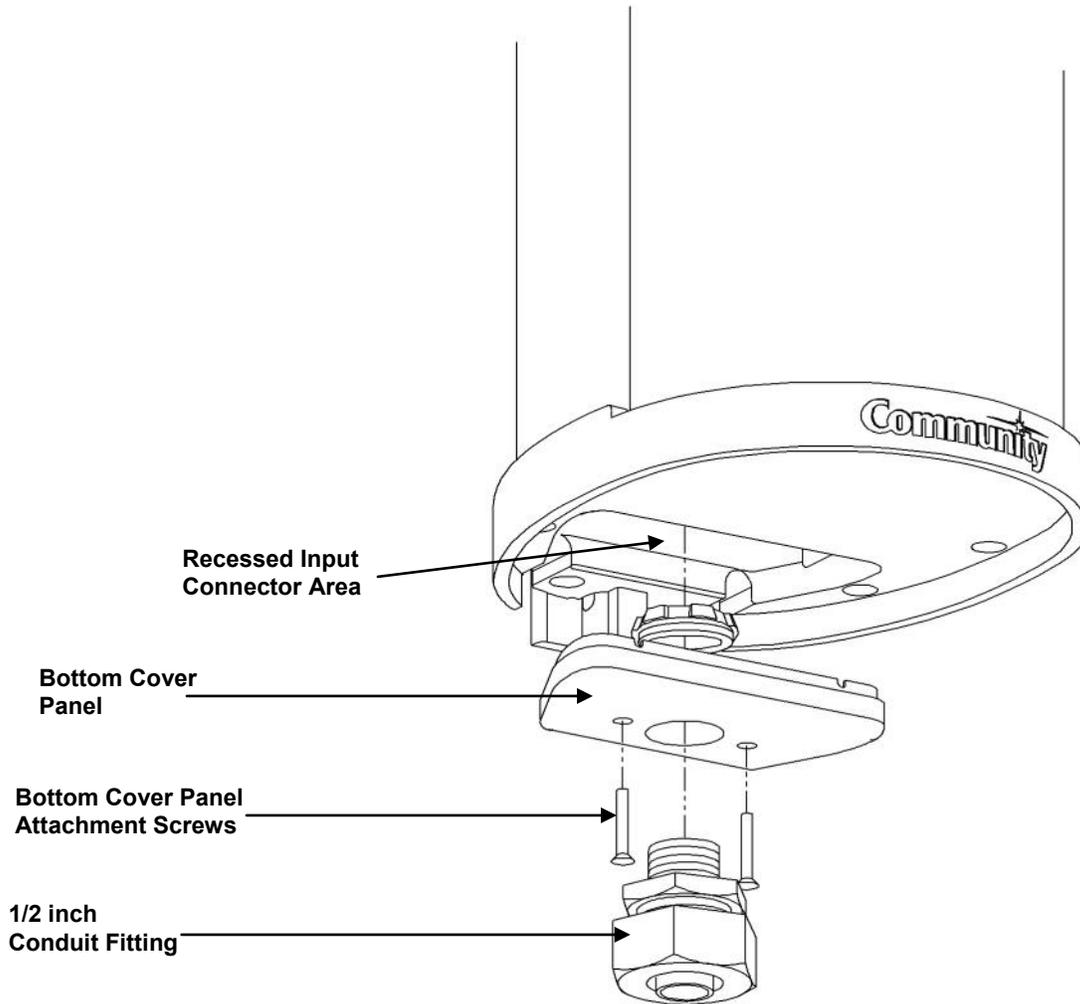


Figure 21: NL4 –Type Connection Detail



INSTALLATION

Figure 22: ENTASYS Bottom Cover Panel with Conduit Knock-Out



Polarity and Pin Designations

A positive voltage applied to the + input terminals produces positive acoustic pressure from the loudspeaker. The correct wiring of the NL4-type connector is shown in **Figure 21**.

Recommended High Pass Filters

When operating ENTASYS loudspeaker systems, it is strongly recommended to use an external, active high pass filter to protect the woofers from excessive low frequency excursion. High pass filters will help protect the loudspeaker against damage from over excursion and will avoid using amplifier power that's wasted from attempting to reproduce frequencies below the loudspeaker's intended operating range. A high pass filter set to at least 200 Hz, 24 dB/octave should be used. Increasing the high pass filter to a higher frequency or greater slope should not present any problems for the loudspeaker.

INSTALLATION

Impedance

The ENTASYS Full-Range column loudspeaker has a 12 ohm rated impedance. The ENTASYS Low Frequency column loudspeaker also has a 12 ohm rated impedance. Because of the unique design of ENTASYS it is possible to stack multiple enclosures together and drive them from a single amplifier channel. See **Table 8** below for details on the impedance of multiple ENTASYS loudspeakers driven in parallel.

Table 8: Impedance of Multiple Loudspeaker Columns

Low Frequency Columns	Full-Range Columns	Total Rated Impedance (ohm)	Minimum Impedance (ohm)	Frequency of Minimum Impedance (Hz)
-	1	12	8.4	7,170
-	2	6	4.4	7,060
-	3	4	3.0	7,040
1	-	12	12.1	380
1	1	6	5.9	370
1	2	4	3.9	370
2	1	4	4.1	380

Recommended Amplifier Power

See **Table 9** for the recommended amplifier power for each specific ENTASYS loudspeaker and combination of full-range and low frequency columns in an array driven from a single amplifier channel. Using an amplifier of less power than recommended will not allow maximum performance of the system and may damage the loudspeaker if the amplifier is driven into clipping. Correspondingly, using an amplifier of more power than recommended can result in overdriving the loudspeaker with the potential for damaging the drivers and/or the protection circuitry.

Use of Limiters

Community recommends the use of a limiter to help prevent loudspeaker damage due to sudden transients (dropped microphones, etc.) and to prevent amplifier clipping. When used for this purpose, connect the limiter as the last item in the signal chain before the power amplifier (at the input to the power amplifier). Set the limiter's "threshold" high enough so that no limiting occurs until the signal is near the level of clipping the amplifier. This will be dependent on the input sensitivity setting of the amplifier. Generally, this will be 3 dB greater than the rated input sensitivity of the amplifier. See **Table 10** for typical amplifier sensitivities and the corresponding peak voltage threshold setting.

Set the limiter's "compression ratio" high enough so that the limiter can stop any unwanted signal level from appearing at its output. This should be 10:1 at minimum. Ratios of 20:1 or higher (infinity:1) are recommended.

INSTALLATION

Table 9: Recommended Amplifier Size

Full-Range Columns	Total Rated Impedance (ohm)	Recommended Power (watts)	Required Voltage (V _{RMS})	Amplifier Rating @ 8 ohm (watts)	Amplifier Rating @ 4 ohm (watts)
1	12	600	85	1,800	3,600
2	6	1,200	85	-	3,600
3	4	1,800	85	-	3,600

Low Frequency Columns	Total Rated Impedance (ohm)	Recommended Power (watts)	Required Voltage (V _{RMS})	Amplifier Rating @ 8 ohm (watts)	Amplifier Rating @ 4 ohm (watts)
1	12	600	85	1,800	3,600
2	6	1,200	85	-	3,600
3	4	1,800	85	-	3,600

Low Frequency Columns	Full-Range Columns	Total Rated Impedance (ohm)	Recommended Power (watts)	Required Voltage (V _{RMS})	Amplifier Rating @ 4 ohm (watts)
1	1	6	1,200	85	3,600
1	2	4	1,800	85	3,600
2	1	4	1,800	85	3,600

Table 10: Amplifier Sensitivity and Peak Voltage Threshold Settings

Amplifier Sensitivity (dBV V _{RMS})	Clip (V _{peak})	Limiter Threshold (peak; dBV)	Limiter Threshold (peak; dBu)	Amplifier Sensitivity (dBV V _{RMS})	Clip (V _{peak})	Limiter Threshold (peak; dBV)	Limiter Threshold (peak; dBu)
-6.0	0.5	0.7	-3.0	5.6	1.9	2.7	8.6
-3.1	0.7	1.0	-0.1	6.0	2.0	2.8	9.0
-1.9	0.8	1.1	1.1	8.0	2.5	3.5	11.0
-0.9	0.9	1.3	2.1	8.6	2.7	3.8	11.6
0.0	1.0	1.4	3.0	8.9	2.8	4.0	12.0
0.8	1.1	1.6	3.8	9.5	3.0	4.2	12.6
1.6	1.2	1.7	4.6	10.1	3.2	4.5	13.1
2.3	1.3	1.8	5.3	10.4	3.3	4.7	13.4
2.9	1.4	2.0	5.9	10.9	3.5	4.9	13.9
3.5	1.5	2.1	6.5	11.1	3.6	5.1	14.1
4.1	1.6	2.3	7.1	11.8	3.9	5.5	14.8
4.6	1.7	2.4	7.6	12.0	4.0	5.7	15.1
5.1	1.8	2.5	8.1	14.5	5.3	7.5	17.5

INSTALLATION

Connecting Multiple Loudspeakers to a Single Amplifier Channel

The best way to connect multiple loudspeakers to a single power amplifier is to design a 70-volt or 100-volt distributed system. However, it is acceptable to connect as many as three 12 ohm loudspeakers in parallel and connect this combination to a single amplifier channel provided that the amplifier is rated for the resulting 4 ohm load. See **Table 9** for details on power amplifier size when powering multiple ENTASYS loudspeakers from a single amplifier channel.

Separate input cables may be connected to each ENTASYS loudspeaker even though up to three full-range or low frequency loudspeakers can be driven from a single amplifier channel, provided it is rated to drive the resulting four ohm load. A cleaner looking installation can use a single, large input cable connected to the bottom loudspeaker. The loudspeakers immediately above and adjacent to the bottom loudspeaker may be connected via the dual banana thru connector located in the recess at the top of ENTASYS enclosures. Insert the included Dual Banana Plug Jumper connector into the recess in the bottom of the enclosure that will be at the top of the array (next to the NL4-type connector and dual terminal connectors) **Figure 23**. When a second ENTASYS loudspeaker is placed below this first loudspeaker, the Dual Banana Jumper Plug will engage into the Dual Banana Input Jack on the top of the second loudspeaker, electrically connecting the two loudspeakers in parallel. Repeat for additional ENTASYS as needed.

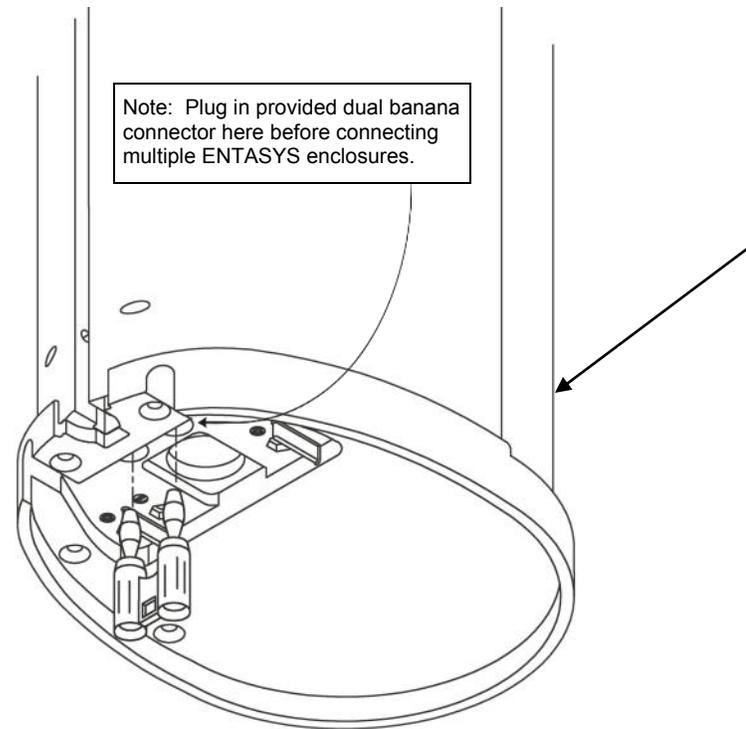
Consult **Tables 8 and 9** to determine the rated load of a particular combination of ENTASYS loudspeakers and how to optimally power them. Do not attempt to place a low impedance load (too many loudspeakers) on an amplifier that is not rated to drive such a load.

Connecting Individual Loudspeakers in an Array to Separate Amplifier Channels

For arrays that contain more ENTASYS loudspeakers than can be driven from a single amplifier channel, multiple amplifier channels should be used. Ideally, the same amplifier model (and settings) should be used to drive each loudspeaker. If this is not possible, each amplifier should be set so that all of the amplifiers have the same voltage gain. It may be possible to accomplish this with the sensitivity/gain setting of the amplifier. If this is not possible, the signal level driving each amplifier should be adjusted to compensate for the different amplifier gains. This may be done passively using input pads or actively using the output level setting of a distribution amplifier or a digital signal processor (DSP).

When connecting adjacent ENTASYS loudspeakers to different amplifier channels **DO NOT** use the included Dual Banana Jumper Plug. Doing so will electrically connect the outputs of these amplifiers, possibly resulting in damage to the amplifier(s) and the loudspeakers.

Figure 23: ENTASYS Dual Banana Plug Jumper



INSTALLATION

Cable Type and Gauge

Community recommends stranded, twisted-pair loudspeaker cable. Insulation should be rated for 600 volts or higher. For outdoor installations, choose a cable designed for the application. For permanently installed systems, a slick, vinyl type insulation is easier to pull through conduit. For portable applications, a rubberized type insulation is more flexible.

To minimize power losses and optimize amplifier damping factor, keep the total cable resistance under 0.2 ohm. For lengths over 100 feet the wire gauges needed to meet this requirement are usually not practical to use for both physical and cost reasons. Therefore #10 AWG is recommended as the most practical gauge for those situations. The run length for both conductors has been figured into the total resistance. Remember that a lower gauge number means a larger wire size.

Table 11: Recommended Cable Gauge

Run Length	Minimum Gauge	Total Resistance
10 ft. (3m)	#16 (1.31 sq mm)	0.08 ohm
25 ft. (8m)	#14 (2.08 sq mm)	0.13 ohm
50 ft. (15m)	#12 (3.31 sq mm)	0.16 ohm
75 ft. (25m)	#10 (5.26 sq mm)	0.15 ohm
100 ft. (30m)	#10 (5.26 sq mm)	0.20 ohm
200 ft. (60m)	#10 (5.26 sq mm)	0.40 ohm
300 ft. (90m)	#10 (5.26 sq mm)	0.60 ohm
400 ft. (120m)	#10 (5.26 sq mm)	0.80 ohm
500 ft. (150m)	#10 (5.26 sq mm)	1.00 ohm

INSTALLATION

RIGGING / SUSPENSION AND SAFETY

-  **TERMINOLOGY:** The terms “rigging”, “flying” and “suspension” are often used interchangeably in describing methods of installing loudspeaker systems at elevated positions.
-  **DANGER:** The loudspeakers described in this manual are designed and intended to be suspended using a variety of rigging hardware, means, and methods. It is essential that all installation work involving the suspension of these loudspeaker products be performed by competent, knowledgeable persons who understand safe rigging practices. Severe injury and/or loss of life may occur if these products are improperly suspended.
-  **DANGER:** All rigging fittings must be fully tightened and secured. Any missing fasteners will compromise the structural integrity of the enclosure and constitute a safety hazard. Do not suspend this loudspeaker unless all fasteners are securely in place!
-  **COMMUNITY RIGGING HARDWARE WARRANTY:** Community warrants that its loudspeaker systems and its optional mounting and rigging hardware have been carefully designed and tested. Community loudspeakers may be safely suspended when each loudspeaker model is suspended with Community-manufactured optional mounting and rigging brackets specifically designed for use with that particular model of loudspeaker. This warranty applies only for use under normal environmental conditions, and when all loudspeakers, component parts, brackets and hardware are assembled and installed in strict accordance with Community’s installation guidelines contained herein. Beyond this, Community assumes no further or extended responsibility or liability, in any way or by any means whatsoever. It is the responsibility of the installer to insure that safe installation practices are followed, and that such practices are in accordance with any and all local, state, federal, or other, codes, conditions, and regulations that may apply to, or govern the practice of, rigging, mounting, and construction work in the relevant geographic territory. Any modifications made to any parts or materials manufactured or supplied by Community shall immediately void all pledges of warranty or surety, related in any way to the safe use of those parts and materials.
-  **WARNING - NON-COMMUNITY RIGGING HARDWARE:** Non-Community hardware used for rigging an ENTASYS loudspeaker must be certified by the supplier for this use and must be properly rated for safety.

Important Notes on Rigging Loudspeakers

There are three areas of responsibility for rigging loudspeakers. The first is the building structure. Always consult with the building architect or structural engineer to assure the ability of the structure to support the loudspeaker system. The second area of responsibility is the loudspeaker itself. Community certifies its loudspeaker systems and rigging accessories for suspension when they are properly installed according to our published guidelines. The third area of responsibility is everything between the loudspeaker and the building structure and the actual process of installation. The installing contractor assumes this responsibility. Loudspeaker rigging should be performed only by certified rigging professionals using certified rigging hardware chosen for the specific application. Prior to installation, the contractor should present a rigging plan, with drawing and detailed parts list, to a licensed structural engineer (P.E.) or architect for written approval.

Acceptable Mounting Point Loading and Working Load Limit

The mounting points should always be used so that either shear force is applied perpendicular to the direction of and in tight proximity to the mounting hole or tension force is applied perpendicular to the enclosure surface.

-  **WARNING:** ENTASYS rigging hardware is rated only for the applications and number of enclosures as described in this manual or in the instructions supplied with the individual hardware items themselves. Do not exceed these limits. Failure to heed this warning could result in injury or death!
-  **DANGER:** Use the mounting points only as described above. Do not use them in such a way as to apply sideways leverage to them. Failure to follow this instruction could result in immediate failure of the mounting points resulting in damage to the loudspeaker and serious injury or death to personnel.

INSTALLATION

Suspending Loudspeakers with Community Brackets

ENTASYS loudspeakers can be rigged using a variety of accessories available from Community. We encourage the use of these rigging accessories because they are properly load rated and designed specifically for use with ENTASYS loudspeakers. Descriptions of these accessories can be found on Pages 17 through 31.

GUIDELINES FOR USING ENTASYS OUTDOORS

ENTASYS is suitable for outdoor installations and has an IP rating of 54W when used as recommended herein. For best results in outdoor applications, follow these guidelines:

- Tilt the ENTASYS downwards at least 2° to prevent water accumulation. The ENTASYS Pan-Tilt Kit may be used for this purpose as described below.
- Use the barrier strip input terminals, as described on Page 35, and replace the cover panel as shown on Page 37. The NL4 type inputs may be used for short-term connections outdoors but are not recommended for long-term outdoor usage.
- Use outdoor-rated cable, such as type SJOW, and route the cable into the ENTASYS through a 1/2-inch NPT fitting (not supplied). The ENTASYS connector cover panel has a knock-out for this fitting.
- Always keep the top connection cover panel tightly in place.
- When stacking two or more ENTASYS in an outdoor installation, insert the dual banana plug jumper connector into the top of the bottom ENTASYS. Then, fill the cavity with a flexible, water-proof caulking compound. Coat the top connector pins of the banana plug with an electrically-conductive grease. Follow the instructions on Page 20 to mount the T-Mounting Brackets and Coupler Bracket. Then, carefully lower the top ENTASYS onto the bottom ENTASYS to complete the electrical connection. Finally, permanently fasten the two ENTASYS to the T-Mounting Brackets with the eight set screws (8 per ENTASYS). Note that this procedure is somewhat different than the one given on Page 40 to enable use of the water-proof caulking compound.
- The supplied ENTASYS T-Mounting Bracket is made of aluminum and is highly weather resistant. Use appropriate size and strength (grade), corrosion-resistant hardware to fasten the T-Mounting Bracket to any building, pole or other structure. See Page 18 for additional fastener guidance.
- ENTASYS Coupler Brackets and Pan Brackets and the supplied fasteners may be used outdoors.
- The ENTASYS Pan-Tilt Bracket may be used outdoors to provide a small downwards tilt. Use one Small Extension Bracket with Locking Bar (supplied with the Pan-Tilt Bracket). **Do not extend the Pan-Tilt Bracket with additional Extension Brackets as this will increase the possibility of damage in high wind conditions.**
- If a safety cable is required, attach it to the accessory Entasys Fly Kit (ENT-FK). Use the Pan-Tilt Bracket, as described above, to provide clearance between the Fly Kit and the pole or other structure.
- Installation in areas that experience frequent dust or sand storms is not recommended. ENTASYS' grille cloth may become clogged, degrading performance.
- Winter ice storms may temporarily clog the ENTASYS grille. This will not harm the ENTASYS but may degrade performance due to the temporary grille blockage.
- Contact Community's TAG Team (Technical Applications Group) for additional assistance.

INSTALLATION

PAINTING ENTASYS ENCLOSURES

ENTASYS loudspeakers are available as standard items with a black or white powder coat finish. Custom colors are available upon request and approval from Community. The powder coated aluminum enclosure may be painted using standard off-the-shelf paint suitable for use on powder coated surfaces. The nylon end caps cannot be painted with this type of paint. These should be painted with Krylon® Fusion for Plastic®, Plasti-Kote® Plastic-Bond Enamel, or Rust-Oleum® Plastic paint that is specifically formulated for use on plastic parts. Alternatively, the enclosure may be coated first with a plastic surface primer such as Plasti-Kote® Plastic Primer or Rust-Oleum® Plastic Primer. A second coating of paint may then be applied on top of the primer coat.

ENTASYS grilles are powder-coated steel. To paint the grille, carefully remove the cloth backing and use paint that is compatible with powder coating to paint the grille. Do not paint the cloth. Contact Community for replacement grille cloth. Apply the grille cloth by using a fine mist of spray adhesive on the grille. (Do not spray adhesive on the cloth.) Then, attach the cloth by passing it onto the interior surface of the grille. Be careful not to clog the pores in the cloth.

SYSTEM DESIGN GUIDELINES

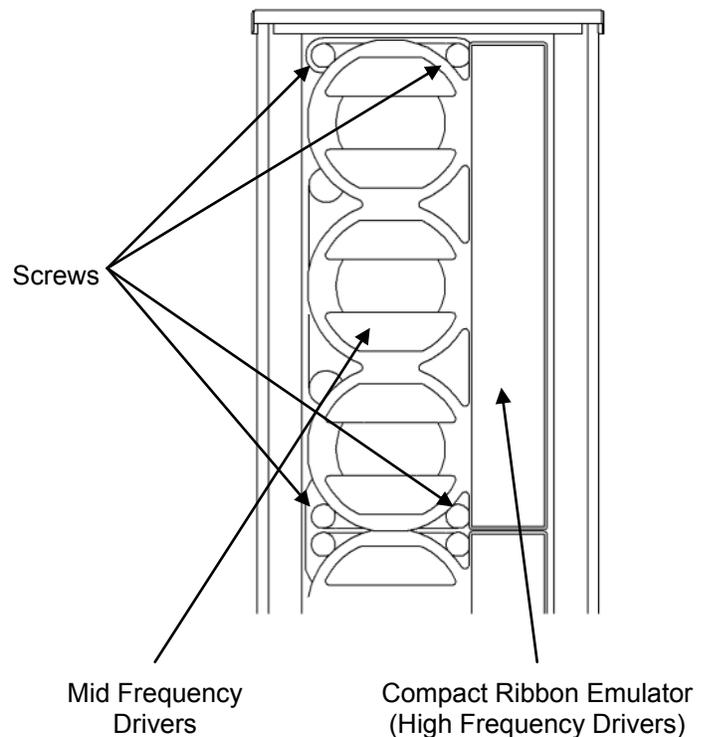
Straight vs. Arced Configuration

The ENTASYS Full-Range column loudspeaker is shipped from Community with its mid frequency and high frequency drivers in the curved configuration. This yields a vertical beamwidth of 12° above approximately 1 kHz. When a smaller array opening angle (beamwidth) is desired the mid and high frequency driver modules may be placed in the straight configuration.

It may also be beneficial to only have the top or bottom half of the array curved and have the other end straight; such as when joining two ENTASYS full-range columns together to form a larger array.

Plastic spacers are placed between the baffle and the back of the mid/high frequency modules to obtain a specific configuration. The straight configuration uses only 34.2 mm spacers in all of the locations. The curved configuration uses three other size spacers (31.4 mm, 23.2 mm, and 9.5 mm) in addition to the 34.2 mm spacer. To reconfigure ENTASYS to the straight configuration remove each mid/high frequency module and replace each of the smaller spacers with a 34.2 mm spacer .

Figure 24: ENTASYS MF/HF Module Screw Locations

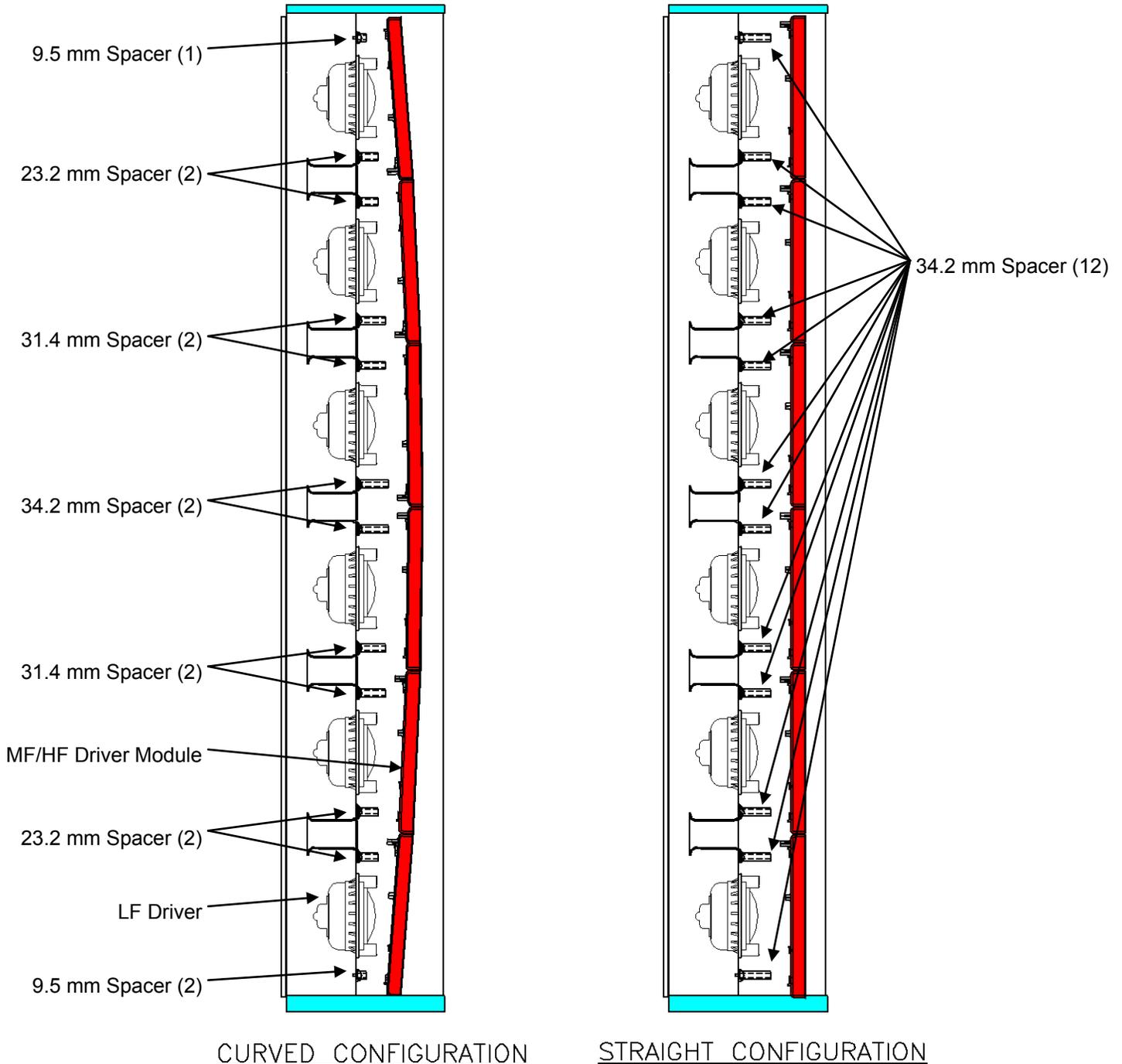


INSTALLATION

Each of the mid/high frequency modules are attached to the baffle with four, M4 screws. These screw into taped holes in the aluminum baffle. There are no nuts to have to hold or catch inside the enclosure. Shorter screws are used with some of the smaller spacers. These will need to be placed with the included longer 60mm screws when the larger 34.2 mm spacer is used.

Important Note: You must reapply a medium strength threadlocking adhesive (Loctite Blue 242 or similar) to all LF and MF/HF screws before reassembly.

Figure 25: ENTASYS Full-Range Curved and Straight Configuration



INSTALLATION

Near Field / Far Field Transition

One aspect of line arrays that differ from other types of loudspeaker systems that should be kept in mind is the transition from the near field to the far field. This is related to the size of the source and the wavelength (frequency) that the source is radiating. The near field distance increases with increasing source size and with increasing frequency. For “point source” type loudspeaker systems this transition usually occurs fairly close to the loudspeaker and can usually be neglected.

For a line array, however, the source size (line length) can be very large. This can push the near field out to a considerable distance away from the loudspeaker. When this occurs the sound system designer and/or installer needs to be aware of it. In the near field, the sound pressure level will decrease 3 dB for every doubling of distance away from the loudspeaker. In the far field, the sound pressure level will decrease 6 dB for every doubling of distance away from the loudspeaker. Since the transition between the near field and far field is frequency dependent, this may lead to changes in the frequency response of the line array at different distances. This can be used advantageously to help mitigate the effects of air absorption of high frequencies.

Increasing Low Frequency Directivity

In order to maintain directivity control at low frequencies (large wavelength), a line array must be physically large. In general, the length of the line must be on the order of one wavelength long to begin to yield directivity control (i.e. approximately -6 dB at 45°). Increasing line array length compared to wavelength results in a narrower, more well defined radiation lobe. For a very small opening aperture (beamwidth) the line length may need to be four times as long as the wavelength to be controlled.

Table 12 shows the relationship between frequency, wavelength, the size of single and multiple column ENTASYS arrays, and the directivity control expected. When the line length is approximately four times the wavelength (or greater) at a given frequency, the directivity control should be good at this frequency. When the line length is approximately two times the wavelength at a given frequency, the directivity control will be decreasing but acceptable. If the line length is less than approximately two wavelengths there will be directivity control but not a tight, small beamwidth lobe usually associated with a line array system.

Compare single ENTASYS and three ENTASYS columns in this table to **Figures 2 and 3**.

Table 12: Frequency, Wavelength, ENTASYS Column Size, and Directivity Control

Frequency (Hz)	1x Wavelength (feet)	2x Wavelength (feet)	4x Wavelength (feet)	1x ENTASYS (feet)	Good Control	2x ENTASYS (feet)	Good Control	3x ENTASYS (feet)	Good Control
200	5.650	11.301	22.602	3.333	No	6.667	No	10.000	Marginal
250	4.520	9.041	18.081	3.333	No	6.667	No	10.000	Marginal
315	3.588	7.175	14.350	3.333	No	6.667	No	10.000	Marginal
400	2.825	5.650	11.301	3.333	No	6.667	Marginal	10.000	Yes
500	2.260	4.520	9.041	3.333	No	6.667	Marginal	10.000	Yes
630	1.794	3.588	7.175	3.333	Marginal	6.667	Marginal	10.000	Yes
800	1.413	2.825	5.650	3.333	Marginal	6.667	Yes	10.000	Yes
1,000	1.130	2.260	4.520	3.333	Marginal	6.667	Yes	10.000	Yes
1,250	0.904	1.808	3.616	3.333	Yes	6.667	Yes	10.000	Yes
1,600	0.706	1.413	2.825	3.333	Yes	6.667	Yes	10.000	Yes
2,000	0.565	1.130	2.260	3.333	Yes	6.667	Yes	10.000	Yes

INSTALLATION

FIELD SERVICE

Any driver service required is done from the front of the enclosure. This can be accessed by removing the six screws from the top end cap. The mounting bracket must also be removed from the enclosure (see Figure 4 on Page 17 for details). Carefully remove the top end cap. The grille may then be removed by gently squeezing on its sides and pulling it away from the enclosure. Be careful to collect the soft plastic grille extrusion pieces that fit on the top and bottom edges of the grille as they may fall off during the removal of the grille.

The crossovers are not field serviceable. For warranty repair, contact Community directly or ask us for the location of your nearest Authorized Service Center.

CHOOSING THE RIGHT LOUDSPEAKERS AND ELECTRONICS

Choose the necessary number of ENTASYS loudspeakers, with high enough maximum SPL, to provide the needed SPL at the farthest listener with an appropriate headroom. Typical headroom factors are at least 6 dB for voice paging, at least 10 dB for voice reinforcement, and at least 20 dB for music reinforcement.

Select the proper ENTASYS loudspeakers and optional low frequency and/or subwoofer loudspeaker models to achieve the right frequency response for the application. Subwoofers may improve the sound quality of a music reinforcement system but may also reduce intelligibility in a voice-only system in a reverberant space.

Configure ENTASYS loudspeakers to have the right coverage pattern to cover the audience evenly. Point the loudspeakers at the listeners and away from walls and ceilings or other obstructions.

Ideally, put all loudspeakers in a central location (central cluster design) or use a distributed system design.

Choose power amplifiers large enough to achieve the needed SPL in the venue with enough headroom to avoid clipping. Use a limiter and high pass filter to protect the loudspeakers. Follow proper wiring design and adjust gains and levels to achieve the best signal-to-noise ratio.

COMMISSIONING THE SYSTEM

Commissioning is the process of optimizing the performance of the system after it has been installed. There are several steps in commissioning including verifying the proper operation of each system component and adjusting system gains and levels.

The last step in system commissioning is known as system equalization or “voicing.” Equalization is the process of adjusting the frequency response of the system to optimize voice intelligibility or musical sound quality (or both). Note that ENTASYS loudspeakers are factory voiced to optimize their speech intelligibility and musical sound quality. For this reason, many designers find they can minimize overall system equalization and still achieve excellent voice intelligibility and musical sound quality.

When equalizing an ENTASYS loudspeaker system the following points should be kept in mind to achieve the best results and to avoid damaging the drivers.

1. Use only small amounts of equalization. In particular do not boost frequencies by more than about 3 dB. When cutting frequencies, attenuation of more than 3 dB is acceptable. Bear in mind that extreme frequency cuts will usually result in less than optimum performance.

2. Do not attempt to boost any frequencies below 100 Hz with a graphic equalizer. Note that with the recommended high pass filter, moderate amounts of boost from a simple bass control are acceptable.

ARRAY COVERAGE CONFIGURATIONS

For More Information and Applications Assistance

For more information on installing and operating your ENTASYS loudspeaker, please refer to Community's web site at www.communitypro.com. For applications support, service or warranty information, refer to Community's web site or contact Community at 610-876-3400 or toll-free at 800-523-4934.

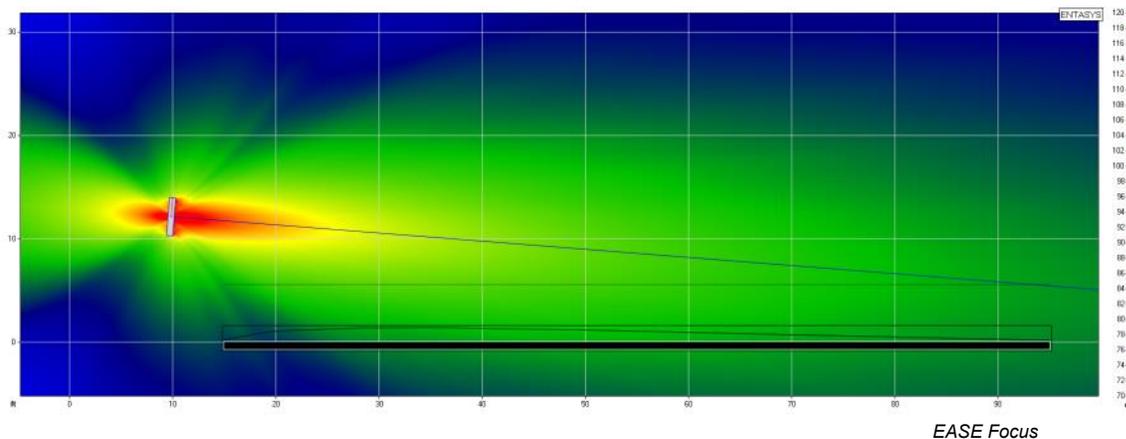
SINGLE FULL-RANGE COLUMN

A single ENTASYS column will provide very good directivity control of a very narrow primary lobe above approximately 1 kHz. This may provide excellent coverage for many applications. As an example, the coverage of a single, full-range column is shown in **Figure 26**. This is an SPL map generated by EASE Focus from the measured data of the individual pass bands of an ENTASYS column. The SPL for the three octave band centered at 1 kHz ranges from 93-99 dB across the entire 80 foot long listening area.

TWO FULL-RANGE COLUMNS

When additional directivity control is required a second ENTASYS full-range column may be added to an

Figure 26: One Full-Range Column (1 kHz)

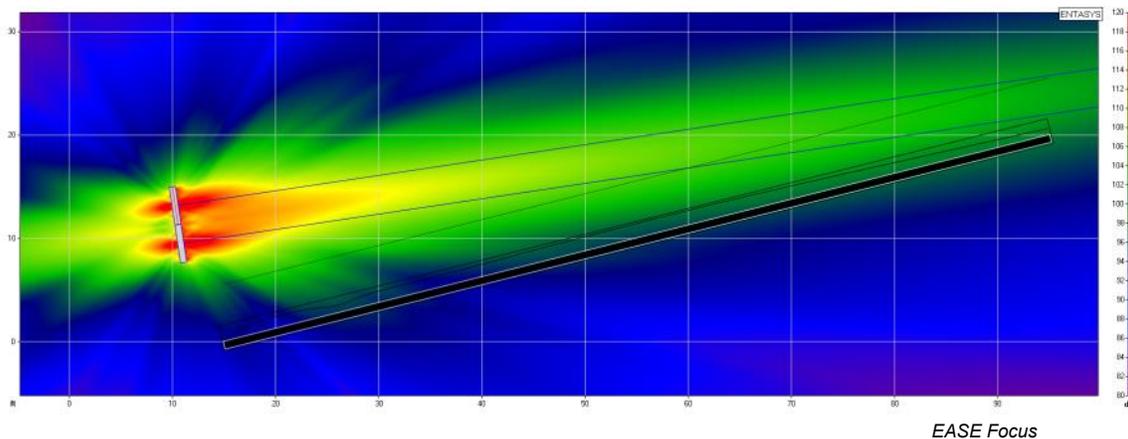


array. This will yield not only greater directivity control in the low frequency region, but also a more narrow beamwidth in the high frequency region. This results from the increased line length for all frequencies. For this configuration the best results will be achieved for most applications when the middle section of the array is straightened. That is to say, the bottom three mid and high frequency modules of the top column are changed from the curved to the straight configuration. Similarly, the top three mid and high frequency modules of the bottom column are changed from the curved to the straight configuration. This combined configuration will result in a more consistent, gradually curved array.

An SPL map of this type of an array used to cover a steeply raked seating area is shown in **Figure 27**. This shows the radiation for the three octave band centered at 1 kHz. Again, the coverage is very consistent ranging from 99-103 dB across the entire 83-foot long listening area.

ARRAY COVERAGE CONFIGURATIONS

Figure 27: Two ENTASYS Full-Range Columns (1 kHz)



ONE FULL-RANGE AND ONE LOW FREQUENCY COLUMN

For applications where additional directivity control is required only for the low frequency region, a single full-range column and a low frequency column may be used. This will leave the opening aperture for the radiation above approximately 1 kHz unchanged from that of a single full-range column. The added length of the line array below 1 kHz will result in a more narrowly focused main lobe at these lower frequencies.

Figure 28 shows an SPL map for a single ENTASYS full-range column for the one octave band centered at 500 Hz. **Figure 29** shows the same map but with a single low frequency column placed on top of the full-range column. A comparison of these SPL maps shows the increased directivity (more narrow beamwidth) of the array using the low frequency and full-range columns. Further increase in low frequency directivity control may be achieved by adding a second low frequency column to this array. Refer to **Table 12** for more details on the frequency ranges affected by the increased line length of multiple columns.

ARRAY COVERAGE CONFIGURATIONS

Figure 28: One Full-Range Column (500 Hz)

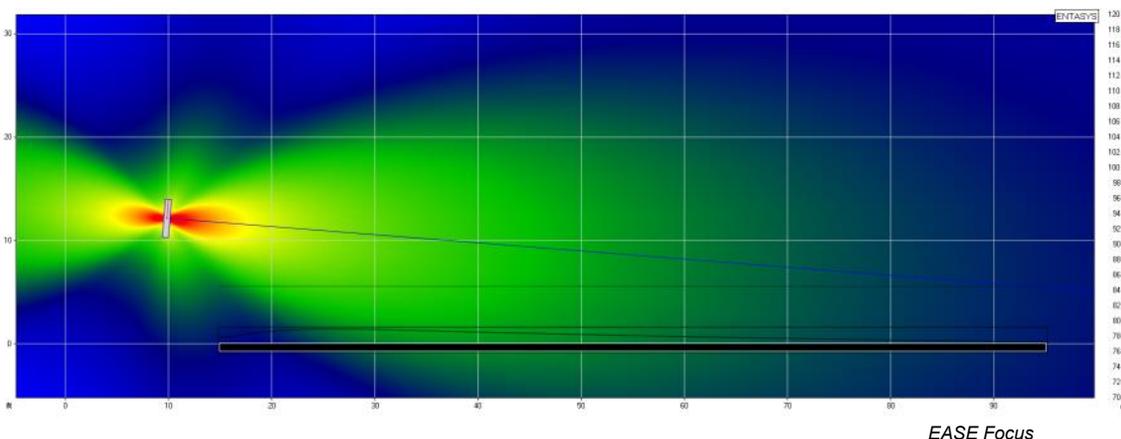
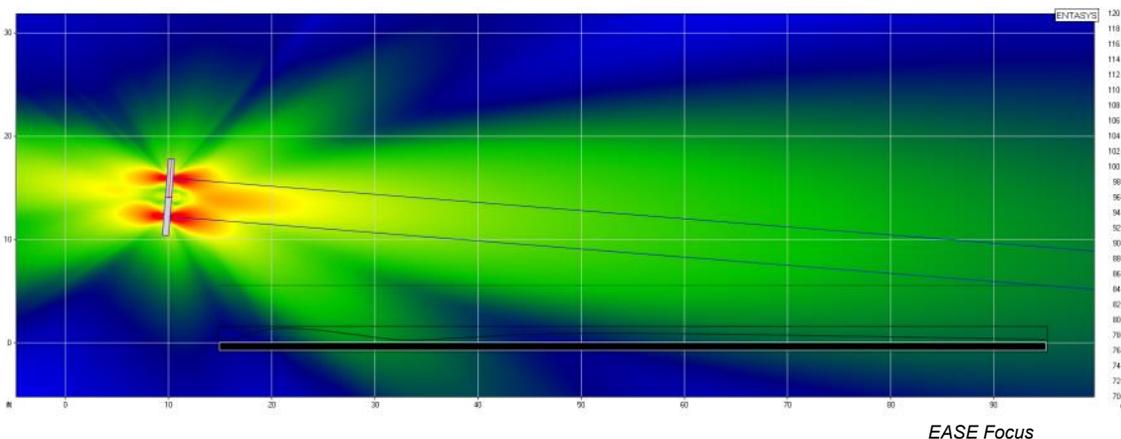


Figure 29: One Low Frequency and One Full-Range Column (500 Hz)



LONG LINE ARRAYS AND THEIR COVERAGE PATTERNS

One thing that should be kept in mind when using line array loudspeakers is the nature of their radiation pattern and the resulting coverage. This can be remarkably different than “point source” loudspeakers. The radiation from a conventional point source type device can theoretically be traced back to a point of origin. This is not the case with a line source. The line source inherently has a height associated with it at its origin, while a point source does not. This fundamental difference can greatly alter the way a line array can be used to cover an area with sound.

As more columns are added to an array the line length gets longer. This results in the narrowing of the vertical beamwidth of the array. At the same time the coverage of the array may actually be increasing due to the increased height of the array. While this may seem counterintuitive, an illustration may help to demonstrate this effect.

ARRAY COVERAGE CONFIGURATIONS

Figures 30 - 32 show 1, 3, and 6 ENTASYS full-range columns in a straight configuration for a one octave band centered at 2 kHz. The center of each array is at a height of 15 feet to make comparison of the sound radiation easier. Notice how the height of the main radiation lobe increases, at a distance of say 60-70 feet from the array, as more columns are added. This occurs even though the coverage angle is decreasing.

Figure 30: One Full-Range Column (2 kHz)

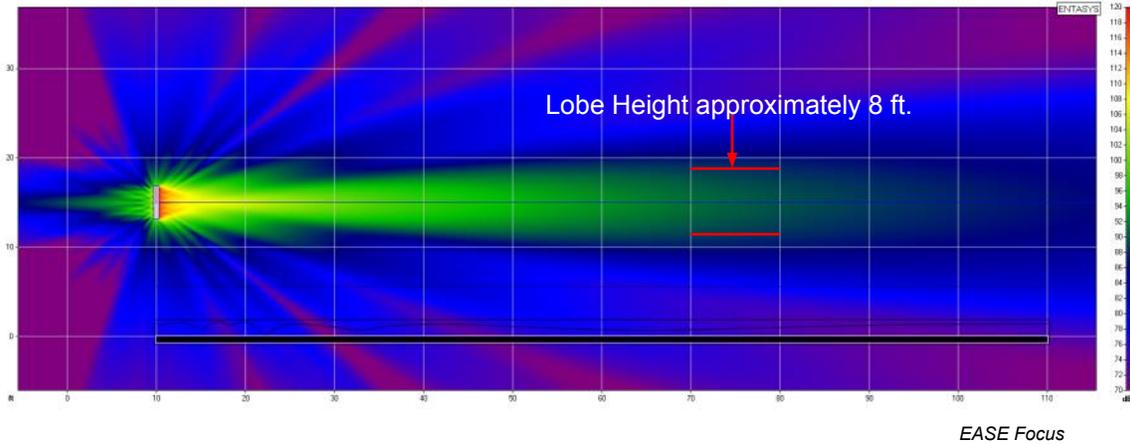


Figure 31: Three Full-Range Columns (2 kHz)

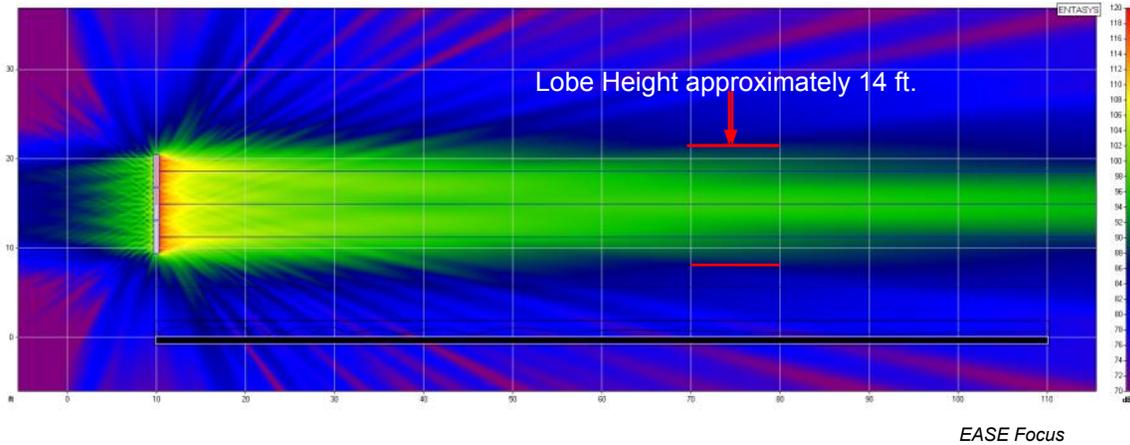
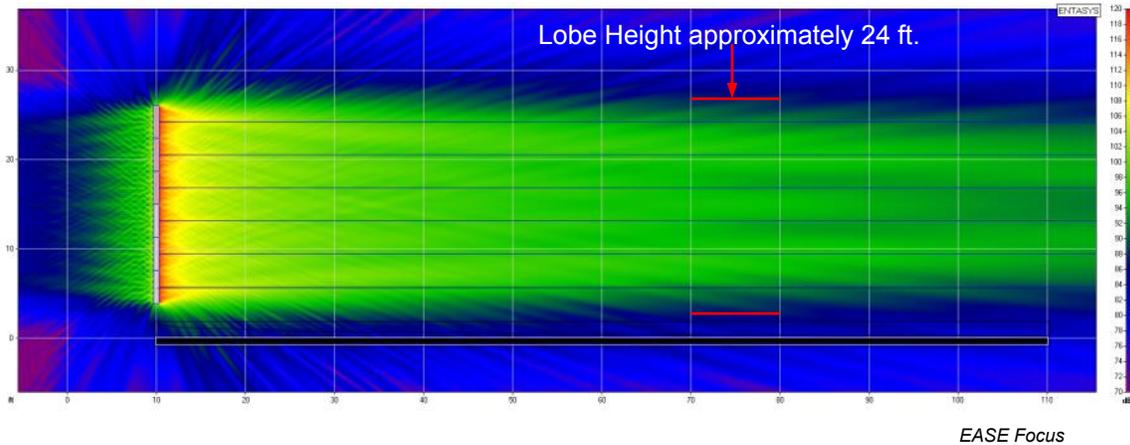


Figure 32: Six Full-Range Columns (2 kHz)



SPECIFICATIONS

Table 13: ENTASYS Loudspeaker Specifications*

ENTASYS	ENT-FR Full-Range Three-Way Column	ENT-LF Low Frequency Column
Frequency Response	200 Hz - 20 kHz	200 Hz - 1.6 kHz
Maximum Input	600 W continuous 1500 W program	600 W continuous 1500 W program
Recommended Amplifier	1200W to 1800W	1200W to 1800W
Sensitivity (1 W / 1 m; 3.46 V)	Curved (12° V): 93 dB SPL Straight (6° V): 95dB SPL	90 dB SPL
Maximum SPL (Single unit)	Curved (12° V): 120 dB SPL Straight (6° V): 122 dB SPL	116 dB SPL
Nominal Impedance	12 Ω	12 Ω
Minimum Impedance	8.4 Ω	12.1 Ω
Nominal Dispersion (1 kHz - 16 kHz)	Horizontal: 120° Vertical: 12°, 6° (user configurable)	Using additional LF column(s) enhances vertical directivity at lower frequencies
Crossover Frequencies	LF to MF: 1 kHz MF to HF: 7 kHz	1.6 kHz Low Pass Filter
Recommended HP Filter	200 Hz, 24 dB/octave	200 Hz, 24 dB/octave
Drivers	LF: Six 3.5" neodymium MF: Eighteen 2.35" HF: Forty-two 1" (six 7" long by 1" wide patent-pending planar-coupled Compact Ribbon Emulators)	LF: Six 3.5" drivers with optimized spacing, allows extension of the narrow vertical beamwidth into the lower frequencies
MF/HF Driver Configuration	Straight, Curved, or Asymmetric Curved	Straight
Input Connections	Top: (1) Dual Banana Plug (male) Bottom: (1) NL4 locking connector (1) Dual Banana Jack (female) (2) Terminal Strip	Top: (1) Dual Banana Plug (male) Bottom: (1) NL4 locking connector (1) Dual Banana Jack (female) (2) Terminal Strip
Enclosure	Aluminum construction, molded nylon end caps	Aluminum construction, molded nylon end caps
Grille	Matching black or white metal curved grille	Matching black or white metal curved grille
Finish	Black or White	Black or White
Supplied Accessories	(1) T-Bar Mounting Bracket (1) Input Wiring Cover (2) Top Connector Cover User configurable vertical coverage adjustment spacers	(1) T-Bar Mounting Bracket (1) Input Wiring Cover (1) Top Connector Cover
Required Accessories:	Digital Signal Processor / 200 Hz High Pass Filter	Digital Signal Processor / 200 Hz High Pass Filter
Optional Accessories	Community offers several optional suspension brackets which attach to the included Mounting Bracket (see Accessory Section of this manual for details)	
Dimensions H x W x D	44.5 x 5.5 x 7.36 inches (1,129 x 140 x 187 mm)	44.5 x 5.5 x 7.36 inches (1,129 x 140 x 187 mm)
Weight	40 lbs (18.1 kg)	25 lbs (11.3 kg)
Shipping Weight	54 lbs (24.5 kg)	40 lbs (18.1 kg)

* Community strives to improve its products on a continual basis. Specifications may therefore be subject to change without notice.

SPECIFICATIONS

Table 14: ENTASYS Transformer Specifications*

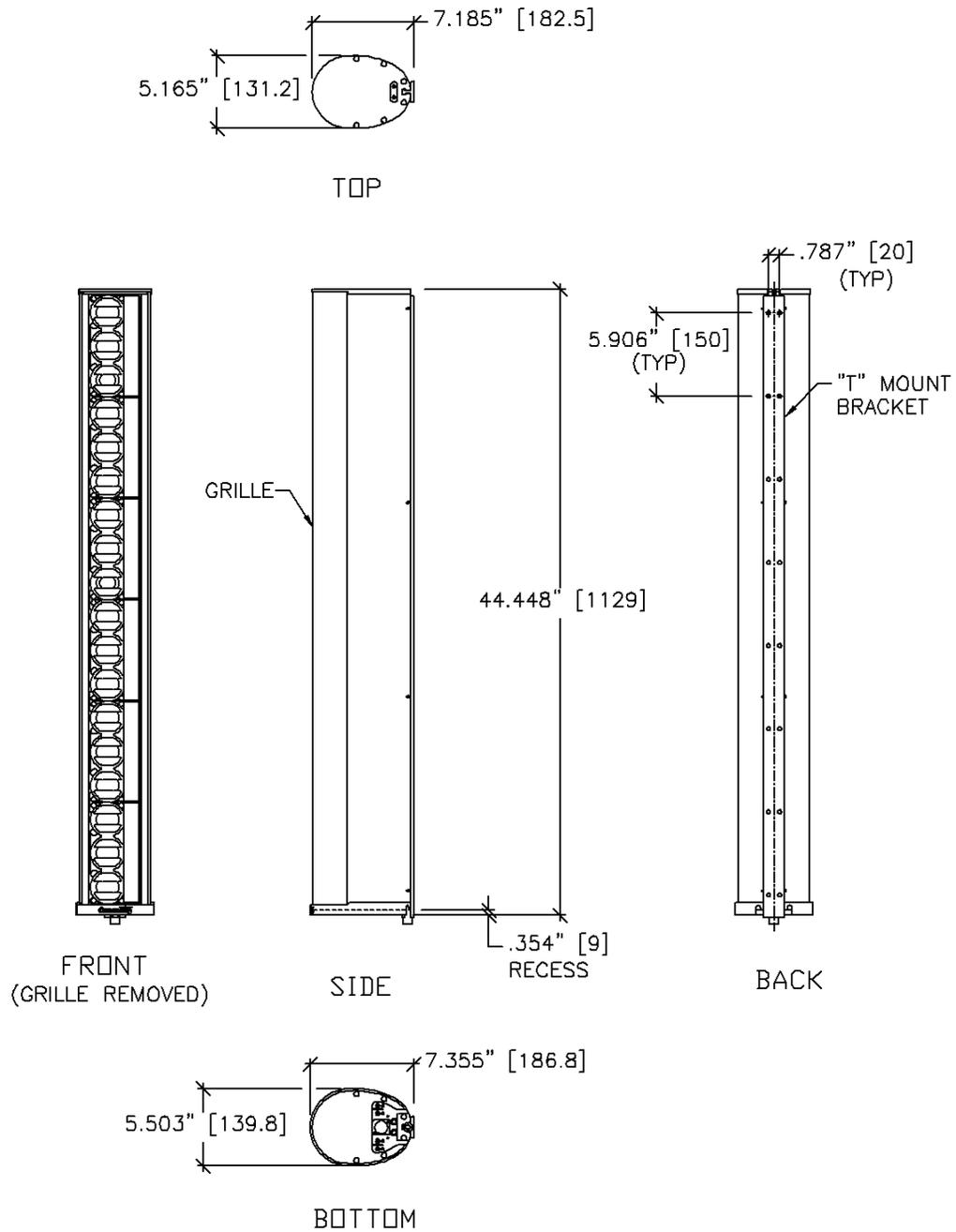
ENTASYS	750 W Autoformer
Frequency Response	See Chart Below
Insertion Loss	0.5 dB
Low Frequency Limit at Maximum Input	100 Hz
Recommended HP Filter	200 Hz, 24 dB/octave
Input Connections	Top: Barrier Strip Terminals Bottom: (1) Dual Banana Jack (female)
Enclosure	One piece aluminum extrusion with molded nylon end caps
Finish	Black or White; Custom Color Options
Mounting / Rigging	Mounting bracket (included)
Dimensions H x W x D	7.67 x 5.5 x 7.36 inches (195 x 140 x 187 mm)

ENT-750T Frequency Response Chart		
Highest Power Tap		
Column Configuration	Frequency Range	Deviation
1 FR	200 Hz - 15 kHz	+0.0 / -0.0dB
1FR+1LF or 1FR+2LF or 2FR or 2FR+1LF	200 Hz - 15 kHz	+0.25 / -0.25dB
3FR	200 Hz - 15 kHz	+0.25 / -0.5dB
Lowest Power Tap		
Column Configuration	Frequency Range	Deviation
1 FR	200 Hz - 15 kHz	+0.25 / -1.0dB
1FR+1LF or 1FR+2LF or 2FR or 2FR+1LF	200 Hz - 7 kHz	+0.5 / -1.0dB
1FR+1LF or 1FR+2LF or 2FR or 2FR+1LF	200 Hz - 15 kHz	+0.5 / -2.0dB
3FR	200 Hz - 7 kHz	+1.0 / -1.0dB
3FR	200 Hz - 15 kHz	+1.0 / -3.0dB

* Community strives to improve its products on a continual basis. Specifications may therefore be subject to change without notice.

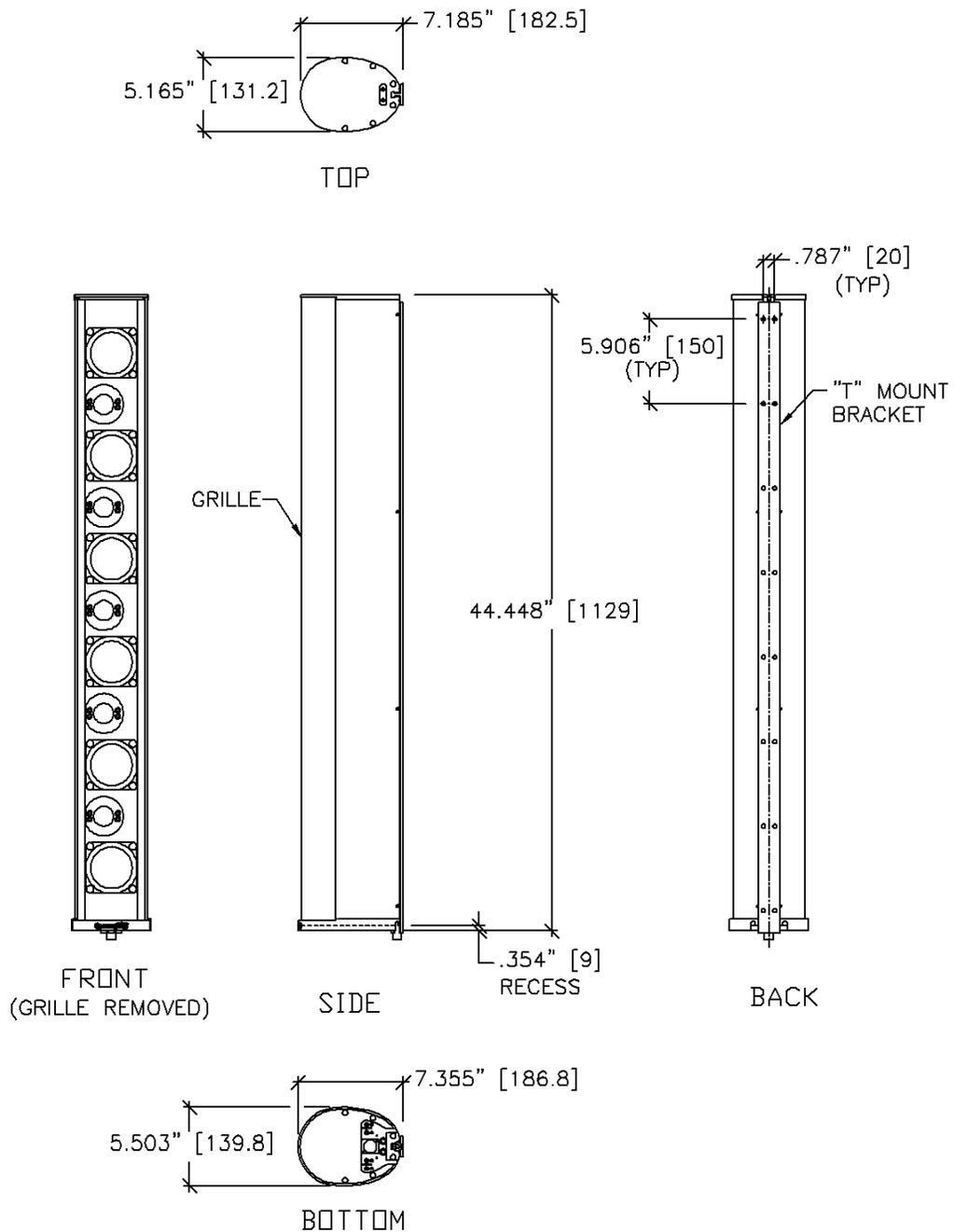
DIMENSIONS

Figure 33: ENTASYS Full-Range Column Dimensions



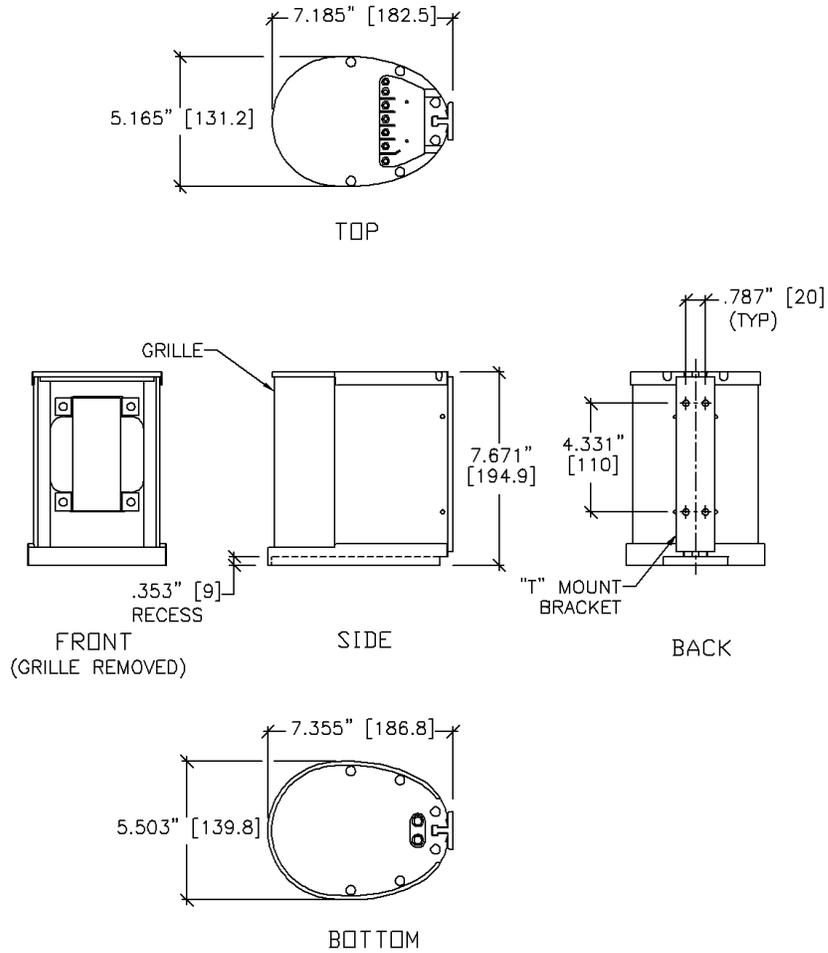
DIMENSIONS

Figure 34: ENTASYS Low Frequency Column Dimensions



DIMENSIONS

Figure 35: ENT-750T 750-watt Autoformer Dimensions



WARRANTY

TRANSFERABLE WARRANTY (LIMITED) VALID IN THE USA ONLY

Community loudspeaker systems are warranted in the USA to be free from manufacturing defects in materials and workmanship for a period of five years, as determined by one of the following two methods, whichever is longer:

Starting from the date of retail purchase, as noted on the sales receipt from an authorized Community dealer,

OR

Starting from the date of manufacture, determined by the serial number, if the sales receipt is not available.

This warranty applies to the product; therefore, the remainder of the warranty period will be automatically transferred to any subsequent owner.

This warranty applies only to failure of a Community loudspeaker caused by defects in materials and workmanship during the stated warranty period. It does not apply to a unit that has been subjected to abuse, accident, modification, improper handling/installation, or repairs made without factory authorization or by anyone other than authorized Community Field Service Stations. This warranty is void if the serial number has been defaced, altered, or removed.

Products covered by this warranty will be repaired or replaced at the option of Community, without charge for materials or labor, provided all the terms of this warranty have been met.

OBTAINING WARRANTY SERVICE

Warranty service may be obtained from the factory, or from an authorized Field Service Station.

To obtain factory or field warranty service for products purchased in the United States, return the product for inspection to the address below, freight prepaid, in the original packaging. If the original packaging is not available, call or write Community Warranty Service to obtain proper packaging materials or hand carry the product to the nearest Field Service Station.

Factory Service Center:

Community Warranty Service
333 East Fifth Street
Chester, PA 19013-4511 USA

Field Service Station:

Call (610) 876-3400 for the nearest Authorized Field Service Station

WARRANTY

For factory service, please call (610) 876-3400 for a Return Authorization (R/A) number before shipping. The following information must be included in the package:

- Owner's complete name, daytime phone number, return street address and return authorization number.
- The serial number of the product being returned and a copy of the retail sales receipt, if possible.
- A complete description of the problem(s) experienced, including a brief description of how the equipment is being used and with what brand, model and output power of amplifier.

Upon receipt, the service center will determine if the problem is covered under warranty. If covered under this warranty, the product will be repaired or replaced, at Community's option, and returned to the owner freight prepaid. If the problem is not covered under this warranty, the owner will be notified of the problem with an estimate of the repair costs.

Consequential and Incidental Damages: Community shall not be liable for any consequential or incidental damages including, without limitation, injury to persons, property, or loss of use. Some states do not allow the exclusion or limitations of consequential or incidental damages, so the above limitations and exclusions may not apply.

This Community warranty is not extended by the length of time which an owner is deprived of the use of the product. Repairs and replacement parts provided under the terms of this warranty shall carry only the remaining portion of the warranty.

Community reserves the right to change the design of any product from time to time, without notice and with no obligation to make corresponding changes in products previously manufactured.

While this warranty gives specific legal rights, there may also be other rights that vary from state to state. No action to enforce this warranty shall be permitted ninety days after expiration of the warranty period.

WARRANTY INFORMATION AND SERVICE FOR COUNTRIES OTHER THAN THE USA

To obtain specific warranty information and available service locations for countries other than the United States of America, contact the authorized Community Distributor for your specific country or region.

NOTES



Community Professional Loudspeakers

333 East Fifth Street, Chester, PA 19013-4511 USA

Phone 610-876-3400 · Fax 610-874-0190

www.communitypro.com