



**ONE SYSTEMS**<sup>®</sup>  
DIRECT WEATHER LOUDSPEAKERS

## Pan and Tilt Brackets Installation Guide

PT-38M and PT-76M

January 2015

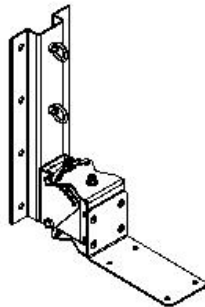
The PT-76M and PT-38M are easy to install and flexible systems designed to allow ONE SYSTEMS loudspeaker products to be mounted to walls or other flat surfaces. The only products approved for use with the PT-76M and PT-38M are as follows:

### PT-38M

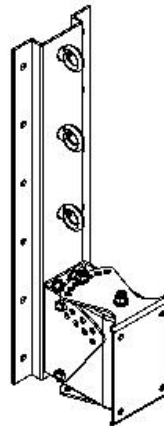
108HTH  
108HTC  
208HTC

### PT-76M

112HTH  
212HC  
312HC  
CFA-2HTH  
118/HSB (See appendix 2)



PT-38M



PT-76M

**NOTE:** The PT-76M and PT-38M were designed for installation on flat surfaces ONLY! The PT-76M and PT-38M may NOT be pole mounted. One Systems offers the PM4-M pole mount system as well as the PM3-M for pole mounting applications of the referenced loudspeakers.

## **NO OTHER LOUDSPEAKERS SHOULD BE SUBSTITUTED!**

The following actions **MUST** be performed **PRIOR** to beginning the installation of the PT-76M or PT-38M:

1. This installation guide must be completely read and understood
2. The instruction manual “Rigging and Suspension of ONE SYSTEMS Products” must be read and understood. (This instruction manual is available along with other technical papers at [www.onesystems.com](http://www.onesystems.com) under the “Documentation” tab
3. The structure of the mating surface **MUST** be capable of supporting the combined weight of the pan and tilt bracket, the loudspeaker and all associated rigging; and must satisfy the required safety factors specified by local and national codes, as well as safe rigging practices.  
The PT-76M weighs 11.4kg (25.1 lbs). The PT-38M weighs 4.5kg (9.9 lbs).
4. The PT-76M and PT-38M pan and tilt brackets should be installed only by someone experienced in the overhead suspension of items. They should be familiar with applicable local/national codes governing the installation of these types of products and those governing the attachment of these types of products to specific structures.
5. **The PT-76M and PT-38M are available in 316 (Marine) grade stainless steel only.**

**NOTE:** Caution should be exercised when connecting One Systems Marine grade products and Marine grade rigging to other metallic, non 316 grade stainless steel surfaces (dissimilar metals). The potential for galvanic corrosion is high in marine environments where the One Systems Marine grade enclosures and rigging are specified or required. Compatible metals and appropriate anode to cathode area ratios must be maintained. A structural engineer with galvanic corrosion experience should be consulted prior to installation of marine grade products, or ANY One Systems products in marine environments.

**CAUTION:** All structures outdoors are subjected to wind forces. These forces must be considered when suspending any product outdoors. It is necessary to know the “Effective Projected Area” (EPA) of the loudspeaker prior to installation of the loudspeaker and the PT-76M or PT-38M. See Appendix 1 of this installation manual for effective projected areas for each enclosure rated for use with the PT-76M and PT-38M. Periodic inspections of the rigging, loudspeaker enclosure and installation are strongly recommended.

**IMPORTANT NOTE:** All products in direct weather installations can be subjected to high wind speeds. For wind speed exposure over 74 miles per hour (119.1 kilometers per hour, 64.3 knots) the loudspeaker enclosure, bracket, link assembly and any secondary safety (not supplied) must be inspected for signs of damage or fatigue!

## INSTALLATION

The PT-76M and PT-38M consist of three parts: the wall bracket, the loudspeaker bracket, and the Link. The PT-76M wall bracket and loudspeaker bracket are shown in Figure 1. Figure 1a shows the wall bracket portion of the PT-76M. The PT-76M bracket allows the loudspeaker to be oriented from a 0 degree down tilt to a maximum down tilt of 35 degrees in 5 degrees increments. The PT-38M allows a down tilt of 40 degrees in 8 degree increments.

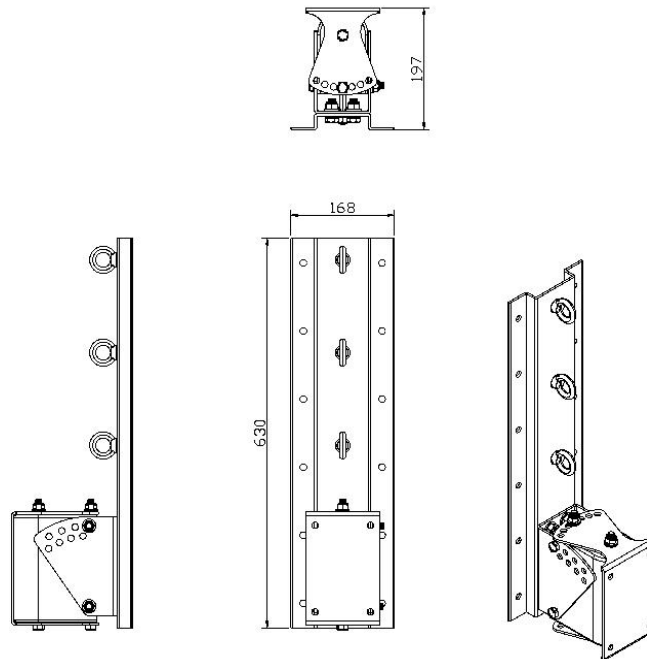


Figure 1

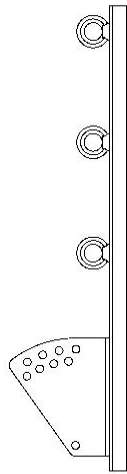


Figure 1a

The PT-38M wall bracket and loudspeaker bracket are shown in Figure 2 below.

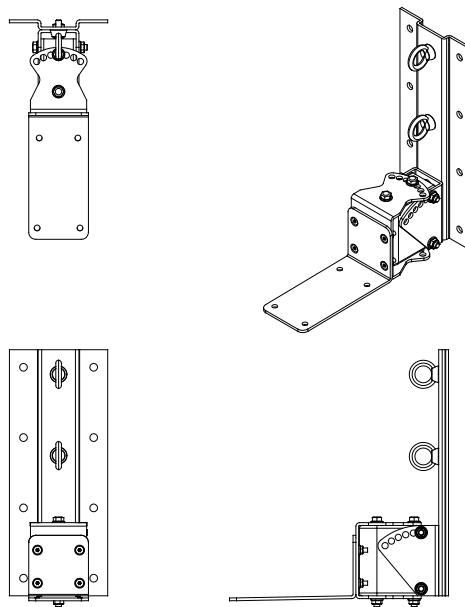


Figure 2

Prior to mounting the wall bracket to the wall the speaker mount section should be removed. See Figures 2a and 2b.

The wall bracket section should now be mounted to the wall surface. The PT-76M has 12 mounting holes and the PT-38M has 8 mounting holes for allowing fasteners to join the bracket and loudspeaker assembly to the mating surface.

**IT IS NECESSARY TO USE ALL MOUNTING HOLES TO INSURE A SAFE AND SECURE MATE TO THE ASSOCIATED SURFACE! (12 for the PT-76M and 8 for the PT-38M)**

All fasteners associated with the mounting of the Pan and Tilt bracket and loudspeaker assembly to the mating surface are the responsibility of others. The design and structural capacity of mating surfaces (such as walls) vary greatly and specific fasteners are designed for use with specific mating surfaces. One Systems does not recommend any mating fasteners and strongly urges the installer to consult with one experienced in suspension of products from the specific mating surfaces and the appropriate choice of fasteners for those specific surfaces.

The wall bracket section should be secured firmly to the mating surface using the appropriate fastening system. The fastening system should be determined by the structure of the mating surface.

**IT IS CRITICAL THAT THE MATING SURFACE BE CAPABLE OF SUPPORTING THE LOAD OF THE PT BRACKET, THE LOUDSPEAKER AND ALL SUSPENSION HARDWARE, AS WELL AS PROVIDING THE PROPER SAFETY FACTORS. DO NOT ATTEMPT TO SUSPEND THE BRACKET AND LOUDSPEAKER UNTIL THE STRUCTURAL CHARACTERISTICS OF THE MATING SURFACE ARE UNDERSTOOD. DO NOT INSTALL THE PT BRACKET AND LOUDSPEAKER IF THE MATING SURFACE IS NOT CAPABLE OF SUPPORTING THE ENTIRE ASSEMBLY WEIGHT, AS WELL AS PROVIDING THE REQUIRED SAFETY FACTORS!**

After the PT wall section of the bracket is securely mounted to the mating surface, the loudspeaker section should be mounted to the loudspeaker using the fasteners supplied. (DO NOT SUBSTITUTE FASTENERS) The loudspeaker mount section of each bracket is shown in figures 2a and 2b.

**NOTE: If the PT76-M is being used with the One Systems 118HSB see Appendix 2 at the end of this document!**

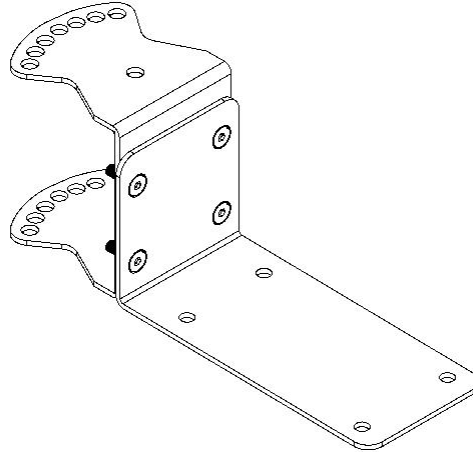


Figure 2a PT-38M speaker mount bracket

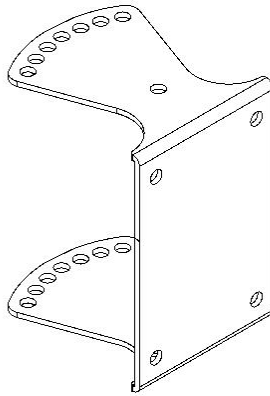


Figure 2b PT-76M speaker mount bracket

The PT-76M mounts to the rear of all IM series enclosures, except for the 108/HTH, 108/HTC and 208/HTC, using the 140mm x 90mm M10 locations as shown in figure 2c. The PT-38M mounts to the bottom of the 108HTH, 108/HTC or 208/HTC as shown in figure 2c using the M8 locations. The mounting locations are highlighted in red.

***DO NOT SUBSTITUTE MOUNTING LOCATIONS!***

Additionally, there are forged shoulder eyebolts supplied in the PT kits, 4 each M10 eyebolts for the PT-76M and 3 each M8 eyebolt for the PT-38M. One of these eyebolts must be installed in the top, rear portion of the enclosure. Make sure that the eyebolt is seated on the surface of the enclosure.

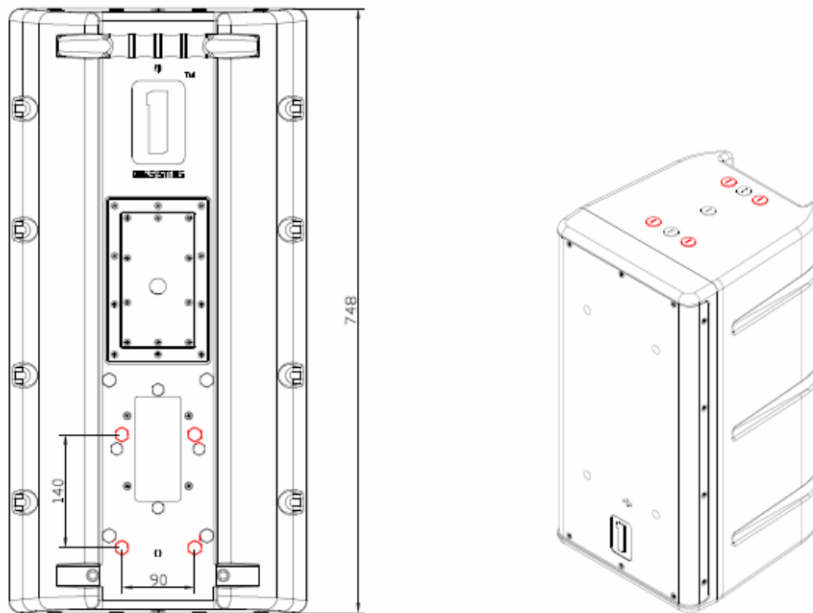


Figure 2c

The loudspeaker and loudspeaker section of the bracket may now be joined to the wall section and the required pan and tilt angles selected. This is a two person job and extreme care should be exercised to avoid serious injury.

The pan pivot bolt should be inserted first and secured but not completely tightened using the nylon insert nuts supplied. The pan pivot bolt is shown below in Figure 2d. Then the pan aiming bolt should be inserted and nylon insert nuts applied. Then the tilt axis bolts should be tightened.

**CAUTION: DO NOT REMOVE THE PAN PIVOT BOLT**

Next the pan angle may be adjusted by removing the pan aiming bolt, but NOT the pan pivot bolt, and setting the desired pan angle and then re inserting the bolt.

The tilt angle may be adjusted by removing the tilt aiming bolt. DO NOT remove the tilt pivot bolt!

Once both the tilt and pan angles are set, make sure that all bolts are tight and secure.

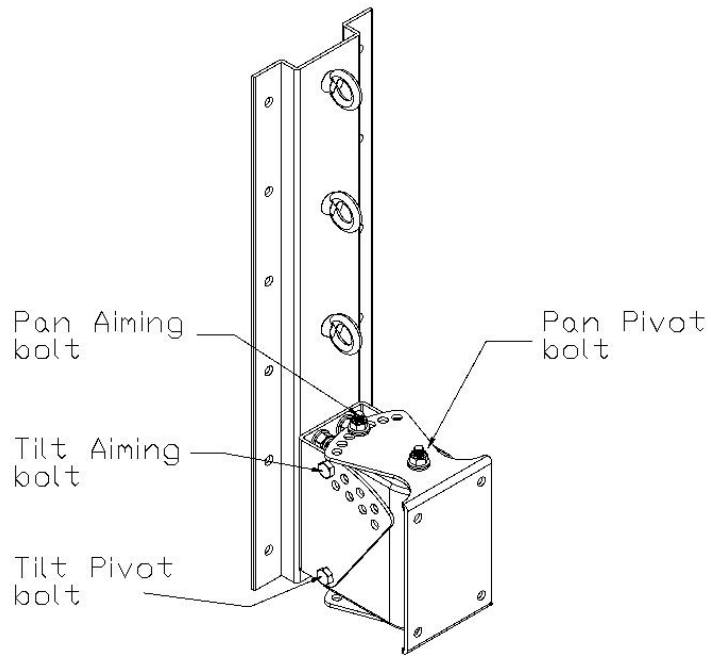


Figure 2d

UNDER NO CIRCUMSTANCES SHOULD THE LOUDSPEAKER DOWNWARD TILT EXCEED 35 DEGREES FROM VERTICAL FOR THE PT-76M. (MAXIMUM 40 DEGREES FOR THE PT-38M)

### INSTALLING THE LINK

Figure 3 is a representation of the Link assembly. This assembly **MUST** be used whenever the PT-76M or PT-38M is being used. Each pan and tilt bracket is supplied with a link assembly.

**SEE SECTION 5 OF THIS MANUAL FOR DETAILS ON THE PROPER MOUNTING OF THE LINK ASSEMBLY!**

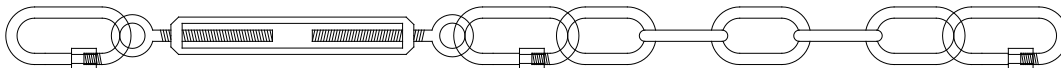


Figure 3



**USE EXTREME CAUTION!** The loudspeaker is heavy and it is likely that the desired mounting location is high in the air. This process should never be attempted by a single person.

TWO OR MORE PEOPLE ARE REQUIRED TO MOUNT THE LOUDSPEAKER ENCLOSURE TO THE WALL, OR POLE, AND PT bracket. Safety harnesses should always be worn when working from an elevated platform.

## **SECTION 5 LINK ASSEMBLY**

Now the Link must be installed.

### **INSTALLING the Pan and Tilt Brackets WITHOUT THE LINK IS NOT ALLOWED!**

The Link (see figure 3) consists of stainless steel quick links, a stainless steel turnbuckle, and several links of stainless steel chain. The use of the chain pieces and quick links with the turnbuckle is based on the tilt angle of the enclosure. The turnbuckle should always be used.

### **DO NOT SUBSTITUTE ANY PART OF THIS LINK ASSEMBLY!**

The Link should be tightened by rotating the turnbuckle until there is very slight tension on the Link assembly. **DO NOT OVERTIGHTEN THE TURNBUCKLE! Warning:** If the turnbuckle assembly is turned and the loudspeaker enclosure angle begins to change (if the down tilt angle begins to move toward 0 degrees vertical then the turnbuckle has been OVER TIGHTENED. Turn the turnbuckle until the down tilt angle is set by the M10 thru bolt on the bracket but there is still very slight tension on the turnbuckle. **DO NOT OVERTIGHTEN THE TURNBUCKLE! ONLY VERY SLIGHT TENSION IS REQUIRED!**

The purpose of the Link is to provide very slight support for the main tilting bracket at the bottom of the assembly.

The back plate sections of the PT-76M and PT-38M have eyebolts attached to them. There are 3 eyebolts on the back plate section of the PT-76M and 2 eyebolts on the back plate section of the PT-38M. Figure 7 illustrates which eyebolt should be used for each down tilt angle.

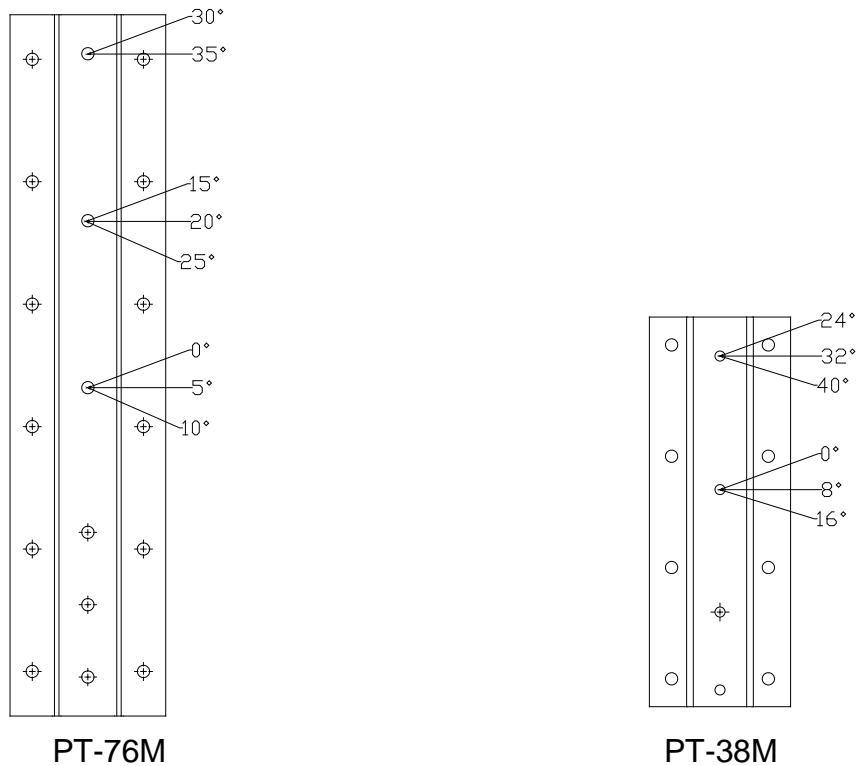


Figure 7

Make sure to use the appropriate combination of Link parts to insure proper connection between the PT bracket assembly and the specific One Systems enclosure. The required combination of Link parts is determined by the down tilt angle of the enclosure.

The assembly may be configured with any combination of turnbuckle, chain link sections and quick link in order to achieve the proper tension on the system, but the turnbuckle must always be used. Figures 8a, 8b, and 8c show a 108IM and PT-38M at vertical, 24 degrees and 40 degrees using the eyebolt positions shown in Figure 7. Note that Figure 8a and 8b use the same link and turnbuckle combination but different eyebolt locations and the Figure 8c uses chain sections as well as the quick links and the turnbuckle.

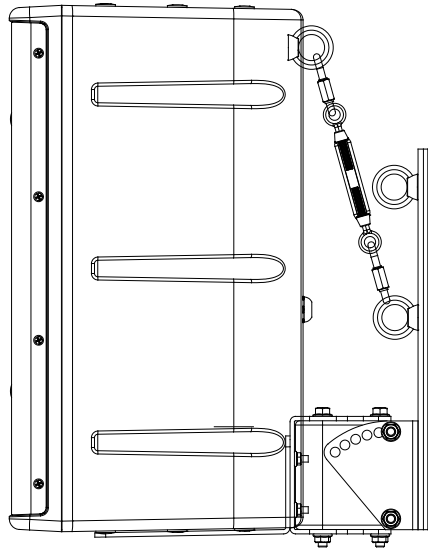


Figure 8a

Figure 8a represents the Link assembly with the enclosure in a vertical orientation and the Link using the lower eyebolt position

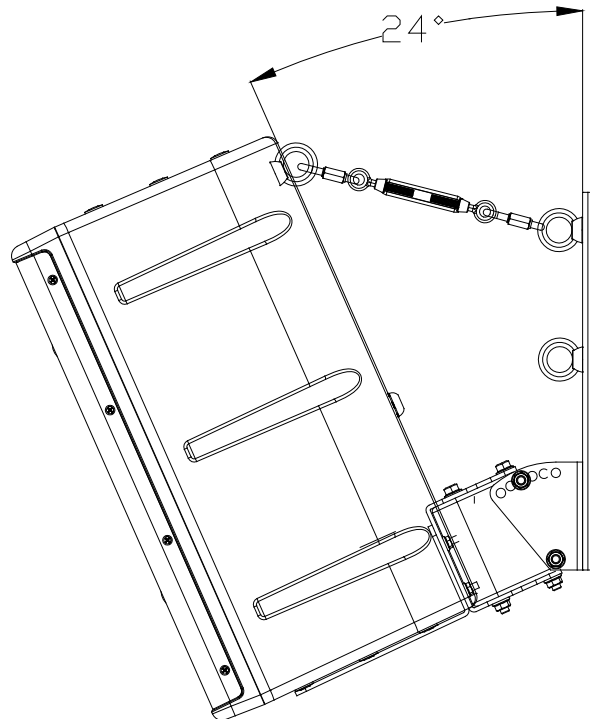


Figure 8b

Figure 8b represents the Link with the enclosure in a 24 degree tilt. The Link is using the top eyebolt and the turnbuckle has been adjusted to provide mild tension.

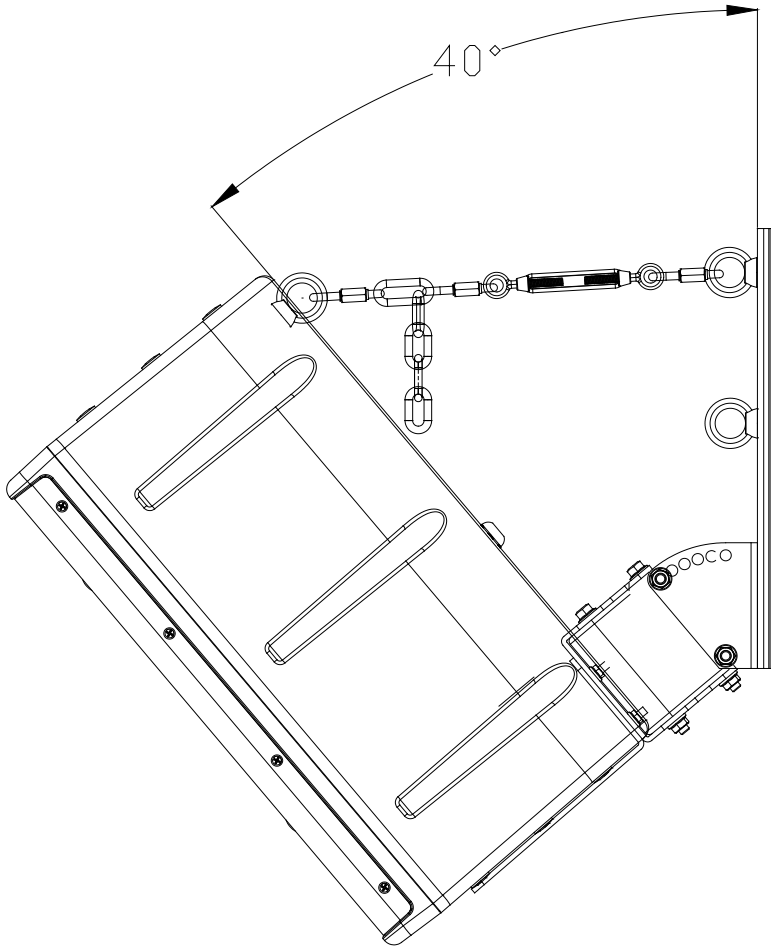


Figure 8c

Figure 8c represents the Link assembly with the enclosure in a 40 degree tilt. The Link assembly uses the top eyebolt and the stainless steel chain has been added to achieve the proper tension on the assembly. Notice the “dropped” chain links in Figure 8c.

**Warning:** If the turnbuckle assembly is turned and the loudspeaker enclosure angle begins to change (if the down tilt angle begins to move toward 0 degrees vertical then the turnbuckle has been OVER TIGHTENED. Turn the turnbuckle until the down tilt angle is set by the M10 thru bolt on the pole bracket but there is still slight tension on the turnbuckle. DO NOT OVERTIGHTEN THE TURNBUCKLE! ONLY VERY SLIGHT TENSION IS REQUIRED!

Figure 9 below shows a 312/HC mounted to a PT-76M. The down tilt is 35 degrees so the top eyebolt is utilized as per Figure 7.

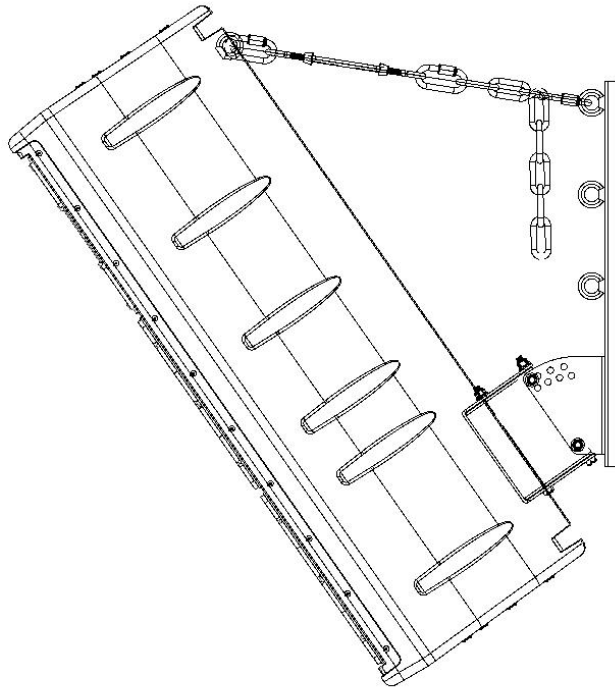


Figure 9

Figure 9 represents the maximum down tilt angle of 35 degrees from vertical. Note that because the down tilt angle is 35 degrees the top eyebolt has been used, again per Figure 7.

Figure 10 is a close up view of the Link assembly. Certain down tilt angles may require a link to be “dropped” from the chain as shown below. The lower quick link is positioned in various chain segments based on the desired degree of down tilt. The turnbuckle should be adjusted, as described in this section

In any position, the turnbuckle must be adjusted to allow the proper amount of tension on the Link. **The Link should never pull the loudspeaker up towards vertical. Only apply VERY slight tension to the turnbuckle!** The Link may be configured with or without the chain section and quick link depending on the down tilt angle of the enclosure.

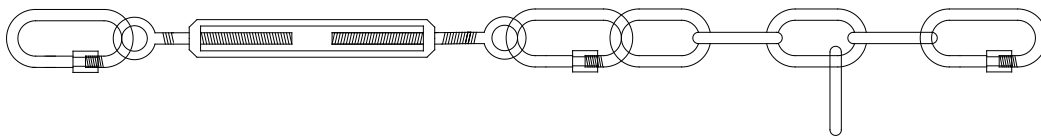


Figure 10

Secondary safety cables are **STRONGLY** recommended and should be secured to a structural point **NOT** associated with the PT bracket or loudspeaker. The Link assembly is **NOT** a secondary safety cable.

## APPENDIX 1

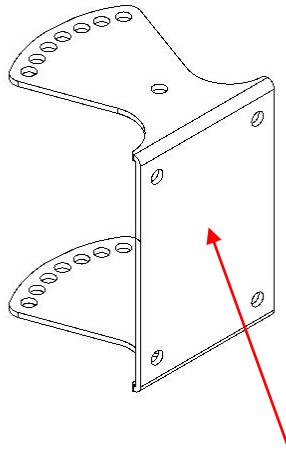
### (Projected Area Values)

The values below should be supplied to the specific pole manufacturer for safety calculations. These values were determined by adding the projected areas of the high frequency horns, the woofer cones and ports to the cross sectional area of the front of each enclosure listed below. Each enclosure will present a different EPA based on wind direction. The values listed below are for wind loads directly into the front of the enclosure and represent maximum values.

108HTH.....	250 in <sup>2</sup> (161,290mm <sup>2</sup> ) (60x40 HF horn)
208HTC.....	207 in <sup>2</sup> (133,550mm <sup>2</sup> )
108HTC.....	169.4in <sup>2</sup> (109,278mm <sup>2</sup> )
112HTH .....	600 in <sup>2</sup> (387,096 mm <sup>2</sup> ) (60x40 HF horn)
212HC.....	600 in <sup>2</sup> (387,096mm <sup>2</sup> )
312HC.....	804 in <sup>2</sup> (550,000mm <sup>2</sup> )
CFA-2HTH.....	855 in <sup>2</sup> (552,100mm <sup>2</sup> )
118HSB.....	531 in <sup>2</sup> (342,516mm <sup>2</sup> )

## APPENDIX 2

IF the PT76-M is being used with the One Systems 118/HSB the silicone gasket (supplied with the 118HSB) must be placed on the surface of the speaker mount bracket BEFORE the speaker mount bracket is mounted to the rear of the 118HSB. The silicone gasket is placed on the surface as shown below.



The Silicone gasket (supplied with the 118/HSB) is placed on this surface BEFORE the speaker mount bracket is mounted to the rear of the 118/HSB!

**The products referenced in this manual are in conformity with the following standards or other normative documents: Machinery Directive 2006/42/EC**