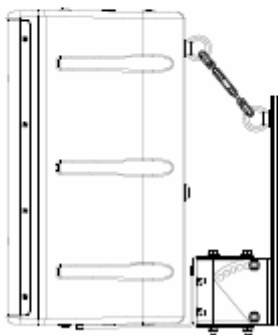


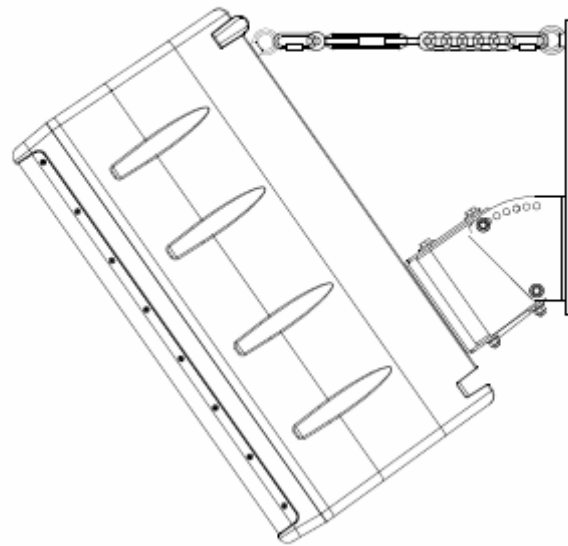


# Pan and Tilt Brackets

## PT-70, PT-35 and PT-10 INSTALLATION (Issued April 2009)



PT-35 with 108IM



PT-70 with 112IM

The PT-70 and PT-35 are easy to install and flexible systems designed to allow ONE SYSTEMS loudspeaker products to be mounted to wall and certain pole structures. The only products approved for use with the PT-70 and PT-35 include the following:

### **PT-70**

112IM  
112IM-70  
112IM-100  
112UM  
212CIM

### **PT-35**

108IM  
108IM-70  
108IM-100  
208CIM  
208CIM-70

212CIM-70  
212CIM-100  
212IM  
212IM-70  
212IM-100  
312CIM  
312CIM-70  
312CIM-100  
CFA  
CFA-70  
CFA-100  
115TW  
115TW-70  
115TW-100

208CIM-100

**PT-10**

103IM  
103IM-70  
103IM-100  
106IM  
106IM-70  
106IM-100

**NO OTHER LOUDSPEAKERS SHOULD BE SUBSTITUTED!**

The following actions **MUST** be performed **PRIOR** to beginning the installation of the PT-70, PT-35 or PT-10:

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 “Education” 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.
4. The PT-70, PT-35 and PT-10 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 pole structures.

**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-70, PT-35 or PT-10. See Appendix 1 of this installation manual for effective projected areas for each enclosure rated for use with the PT-70, PT-35 and PT-10.

## INSTALLATION

**NOTE:** See separate instructions below for the PT-10 (pg 18)

The PT-70 and PT-35 consist of three parts: the wall bracket, the loudspeaker bracket, and the Safety Link. The PT-70 wall bracket and loudspeaker bracket are shown in Figure 1. Figure 1a shows the wall bracket portion of both the PT-70 and the PT-35. The PT-70 bracket allows the loudspeaker to be oriented from a 0 degree down tilt to a maximum down tilt of 30 degrees and the PT-35 allows a down tilt of 25 degrees.

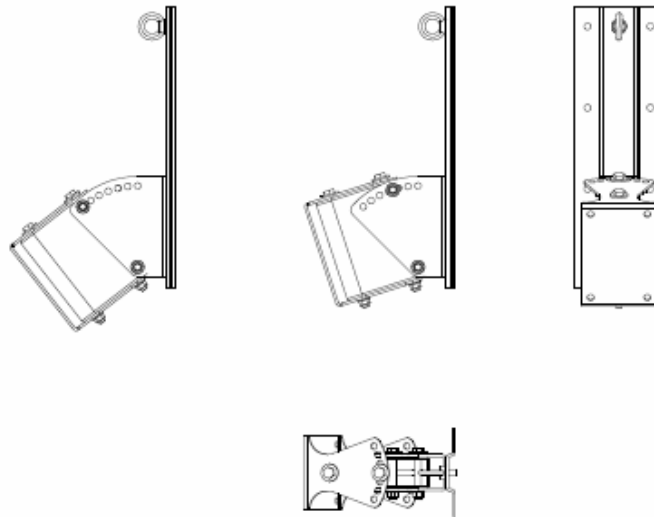


Figure 1

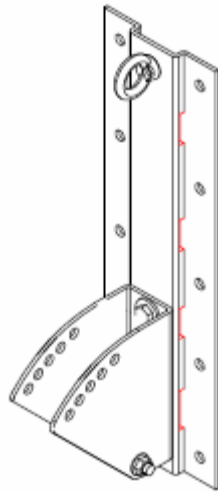


Figure 1a

The PT-35 wall bracket and loudspeaker bracket are shown in Figure 2.

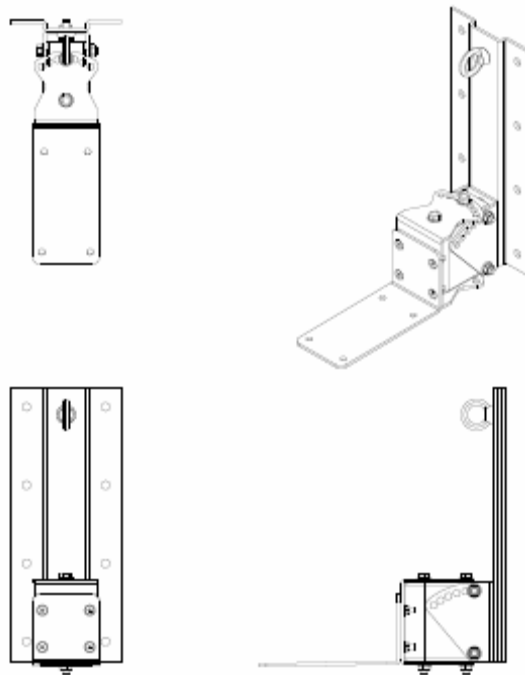


Figure 2

The wall bracket section should now be mounted to the wall surface. The PT-70 has 10 mounting holes and the PT-35 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! (10 for the PT-70 and 8 for the PT-35)**

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 specific mating surfaces and the appropriate choice of fasteners for those specific surfaces.

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.

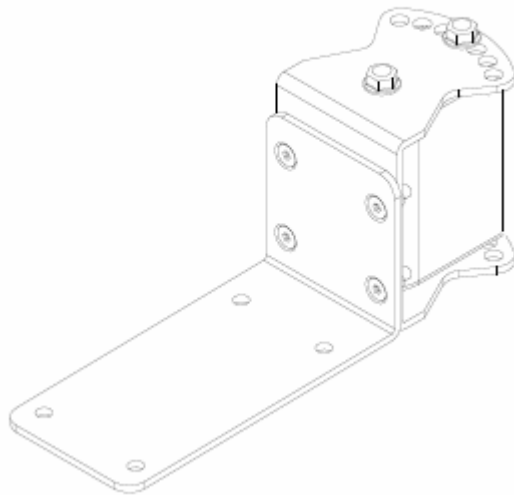


Figure 2a. PT-35 speaker mount bracket

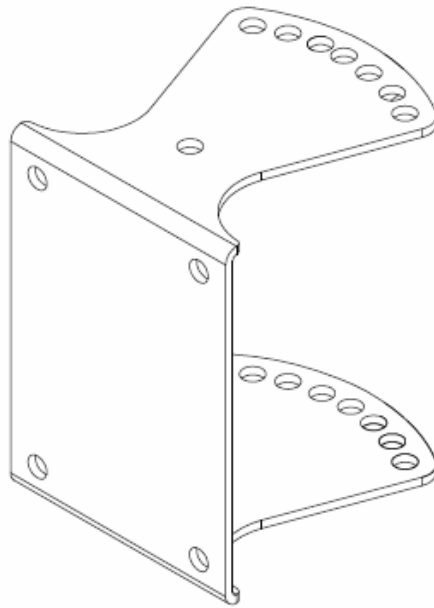


Figure 2b. PT-70 speaker mount bracket

The PT-70 mounts to the rear of ALL IM series enclosures, except for the 108IM and 208CIM, using the 140mm x 90mm M10 locations as shown in figure 2c. The PT-35 mounts to the top or bottom of the 108IM or 208CIM as shown in figure 2c using the M8 locations. The mounting locations are highlighted in red.

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

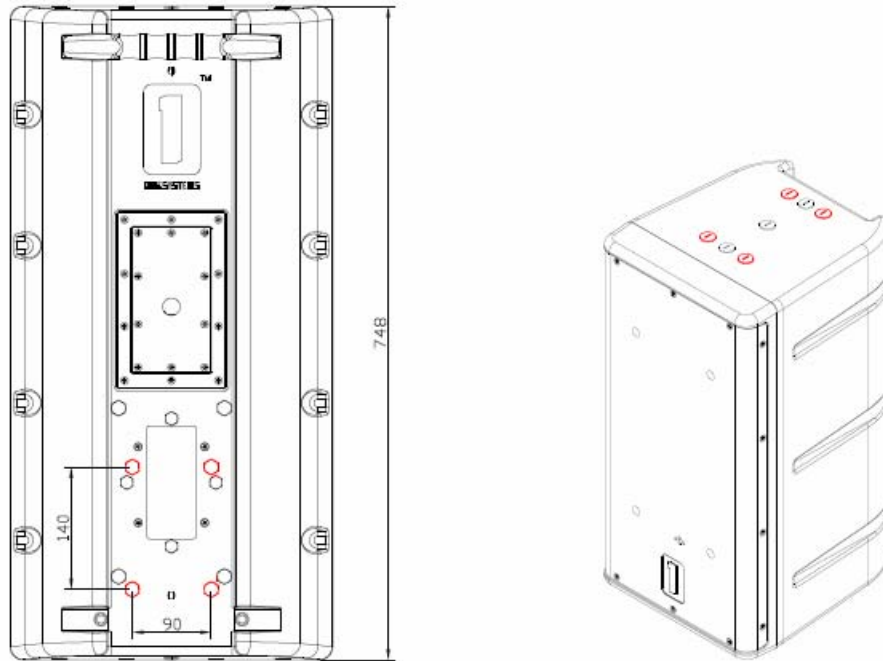


Figure 2c

The loudspeaker and loudspeaker section of the bracket may then 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.

Figure 3 is a representation of the Safety Link assembly. This assembly **MUST** be used whenever the PT-70 or PT-35 is being used. Each pan and tilt bracket is supplied with a safety link assembly.

**SEE SECTION 5 BELOW FOR DETAILS ON THE PROPER MOUNTING OF THE SAFETY LINK ASSEMBLY!**

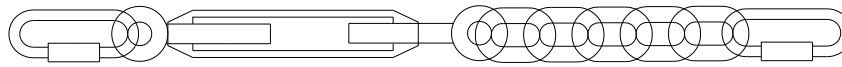


Figure 3

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!

#### POLE MOUNTING THE WITH THE PT-70 AND PT-35

The PT-70 and PT-35 also have slots cut in the wall mount section of the bracket that allow the brackets to be pole mounted. The pole mount section requires that BAND-IT brand stainless steel bands be used. Rectangular poles must have a flat mounting surface of at least 5.5 inches (140mm) for mounting. Circular poles must have a diameter of at least 8 inches (203mm)

Figure 4 shows the PT-70 with slots visible. The slots are shown in red. There are 4 slots and ALL 4 slots must be utilized for secure mounting to a pole. Each of the 4 slots must use BAND-IT bands as described in step 1 below.

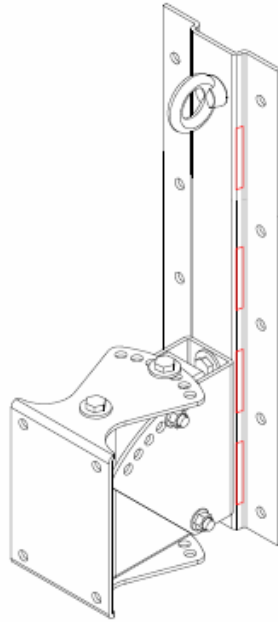


Figure 4

Figure 5 shows the PT-35 with slots visible. There are 3 slots, shown in red. Each of the 3 slots must be utilized to insure a secure mount to a pole.

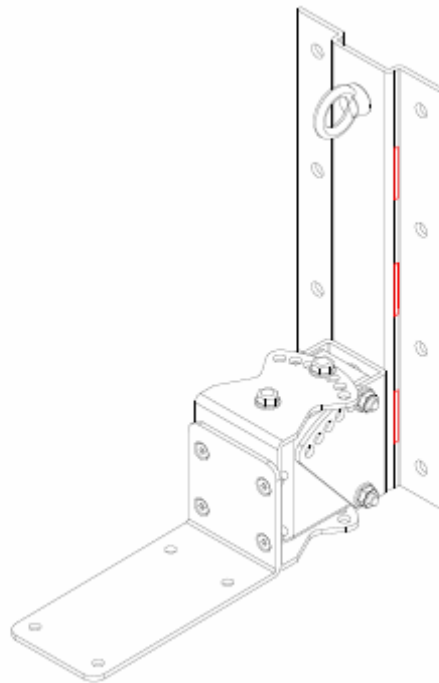


Figure 5

1. Mount the wall bracket section (see figure 1a) of the bracket to the pole at the desired height on the pole. The bracket is mounted to the pole using BAND-IT stainless steel bands. DO NOT SUBSTITUTE bands of other material or other widths! There are four locations on the pole bracket for bands. ALL 4 LOCATIONS MUST BE USED on the PT-70. There are 3 locations for the PT-35, ALL THREE MUST BE USED. Figure 6 illustrates the locations for the stainless steel band clamps.(PT-70 is shown)

It is REQUIRED that each of the four bands be DOUBLE wrapped. Double wrapping will insure a strong and secure mounting of the bracket to the pole. The stainless steel banding materials should be as follows:

BAND-IT	# C206R9 stainless steel bands
BAND-IT	# C25699 buckles
BAND-IT	# C00169 tensioning tool

The stainless steel band is Type 201SS 0.030 inches (0.762mm) thick and 0.750 inches (19mm) wide.

**WARNING:** Do NOT substitute banding materials or banding dimensions.

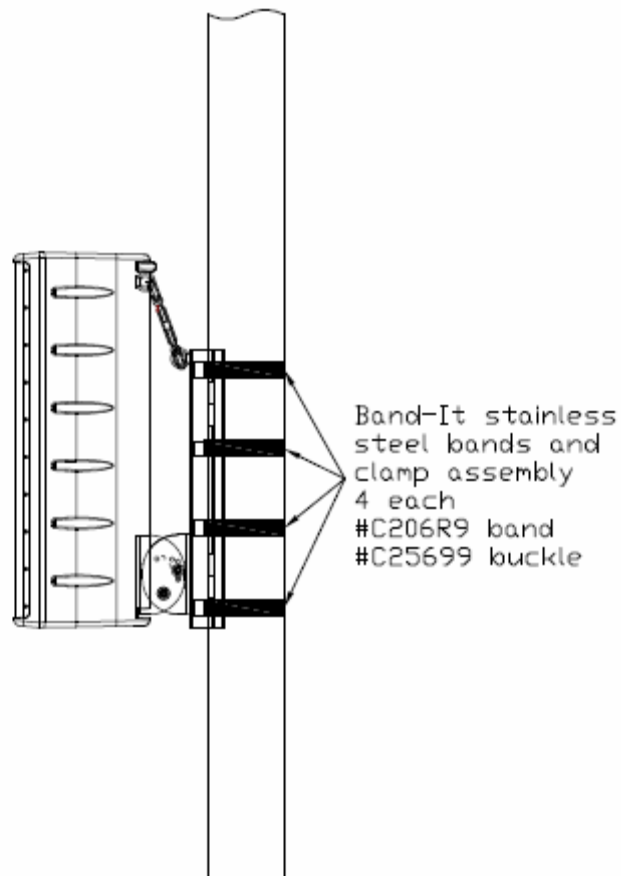


Figure 6  
PT-70 bracket shown

Installation instructions from BAND-IT should be followed exactly. Operating instructions are supplied with the tensioning tool. (All BAND-IT parts and tools purchased separately. These parts and tools are not supplied by ONE SYSTEMS)

The stainless steel banding material, buckles, and tensioning tools are available from the following locations (or through distributors recommended by these locations):

BAND-IT IDEX, Inc.  
4799 Dahlia St.  
Denver Colorado 80216  
USA  
1-800-525-0758

FELIX PONCE  
Calle Ignacio Zaragonza No. 8  
Colonia Ahuehuetes Atizapan 52953  
Edo. de Mexico  
(52) 555825 8502

BAND-IT Company Limited  
Speedwell Industrial Estate  
Stavely, Nr. Chesterfield  
Derbyshire, S43 3PF England  
Home Sales (44) 1246-479479  
Export Sales (44) 1246 479480

BAND-IT Clamps (ASIA) Pte. Ltd.  
11 Second Chin Bee Road  
Singapore 618777  
65-62658853

BAND-IT Shanghai Sales Office  
207 room  
Wanbao International Business Centre  
660# Xinhua Road  
Shanghai, China 200052  
021-62826348-308

2. Next, the loudspeaker bracket should be mounted to the loudspeaker using the supplied M10 (M8 for the 108IM and 208CIM) stainless steel bolts and internal tooth lock washers. DO NOT SUBSTITUTE ANY PARTS
3. Now the M10 (M8 for 108IM and 208CIM) forged shoulder “eye” bolt should be installed in the top rear of the loudspeaker enclosure.
4. The loudspeaker may now be placed on the pole bracket.

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 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)

First insert the bolt into the pivot point and secure, but do not fully tighten using the supplied nylon insert nut.

Now the enclosure may be set at its desired down tilt. The PT-70 bracket allows the loudspeaker to be oriented from a 0 degree down tilt to a maximum down tilt of 30 degrees and the PT-35 allows a down tilt of 25 degrees.

UNDER NO CIRCUMSTANCES SHOULD THE LOUDSPEAKER DOWN TILT EXCEED 35 DEGREES FROM VERTICAL!

## SECTION 5 SAFETY LINK ASSEMBLY

5. Now the Safety Link must be installed.

INSTALLING THE Pan and Tilt Brackets WITHOUT THE SAFETY LINK IS NOT ALLOWED!

The Safety Link (see figure 3) consists of two stainless steel quick links, a stainless steel turnbuckle, and several links of stainless steel chain.

DO NOT SUBSTITUTE ANY PART OF THIS SAFETY LINK ASSEMBLY!

The Safety Link should be tightened by rotating the turnbuckle until there is tension on the Safety Link assembly. Do not over tighten. The purpose of the Safety Link is to slightly remove tension from the main PT-70 or PT-35 tilting bracket at the bottom of the assembly. The Safety Link functions as both a safety and as a load bearing assembly.

The Safety Link should be assembled as shown in Figure 3. Make sure to use the appropriate number of chain links to insure proper connection between the PT-70 or PT-35 and the specific One Systems enclosure. Figure 7 shows the loudspeaker assembly and Safety Link in a 0 degrees vertical orientation.

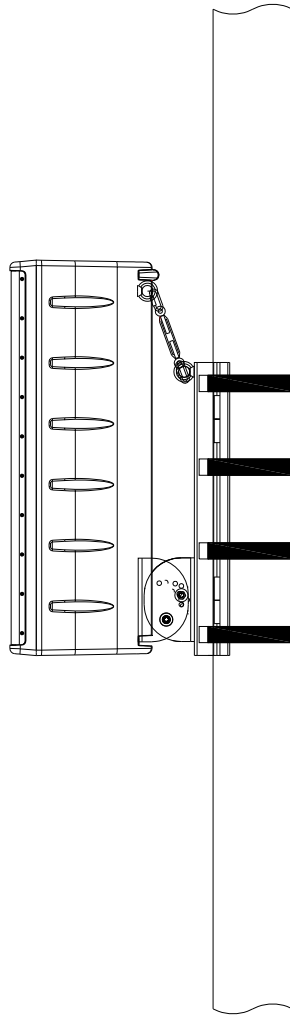


Figure 7

Figure 8 is an enlarged view of the Safety Link assembly configured for a 0 degree vertical down tilt angle.

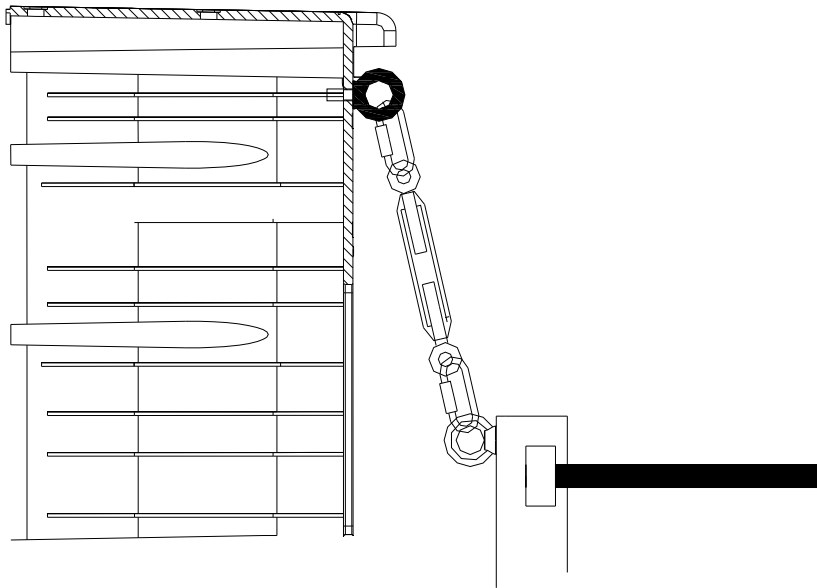


Figure 8

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.

Angles other than 0 degrees from vertical require the stainless steel chain links to be inserted as shown in Figures 9 and 10.

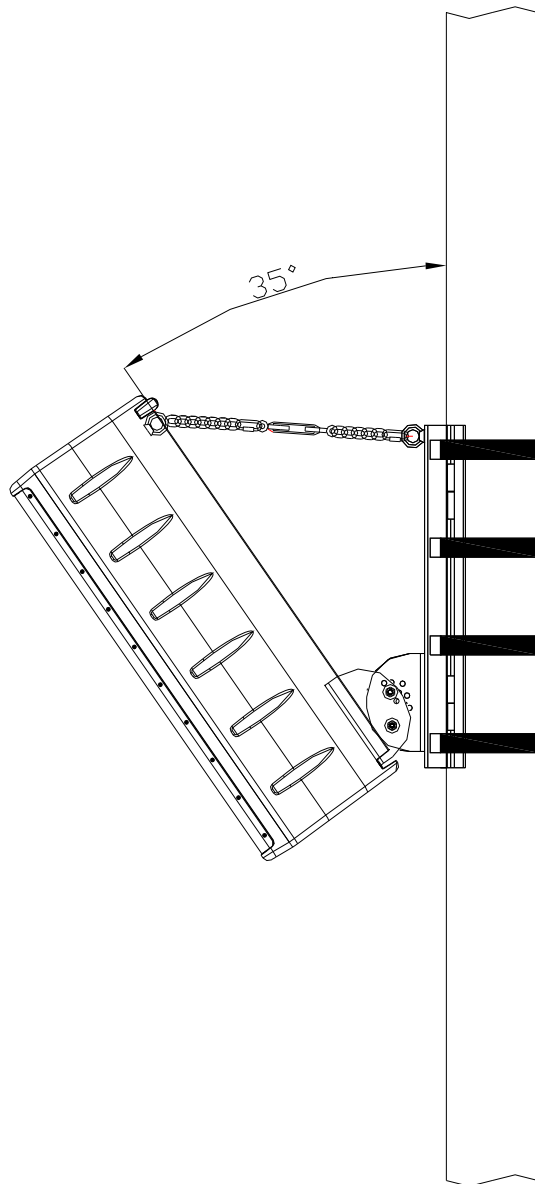


Figure 9

Figure 9 represents the maximum down tilt angle of 35 degrees from vertical. Figure 10 is a close up view of the Safety Link assembly with the chain configured for this maximum angle. 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

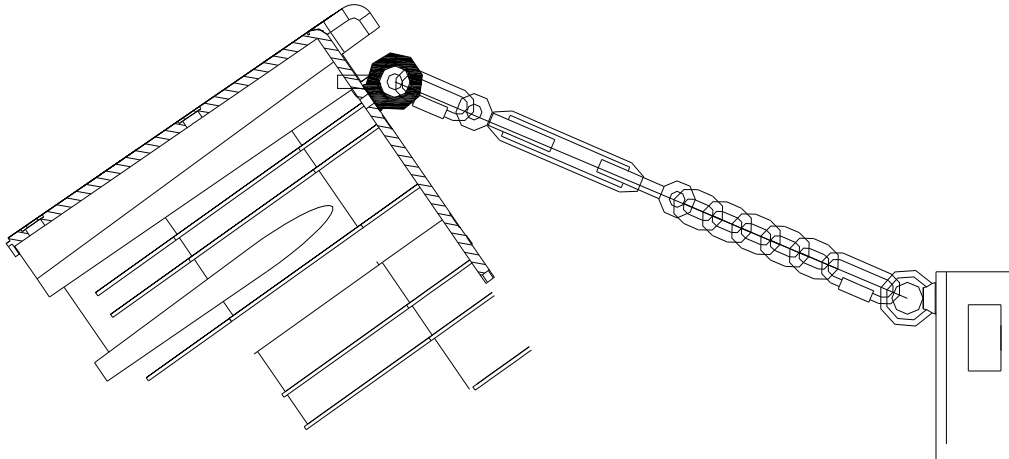


Figure 10

Figure 11 shows a close up view of the Safety Link with one of the chain links moved to allow for an angle of less than the 35 degree max shown in Figure 9.

In any position, the turnbuckle must be adjusted to allow the proper amount of tension on the Safety Link. The safety link should never pull the loudspeaker up towards vertical. The link should be set in order to eliminate loose chain links only!

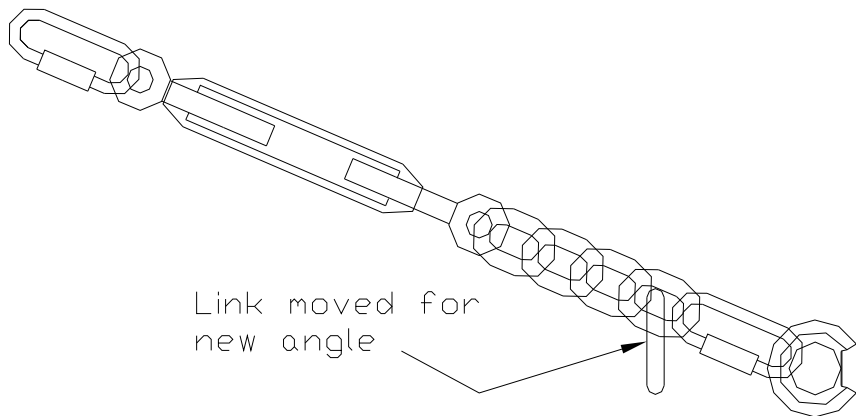


Figure 11

## PT-10 Installation

The One Systems PT-10 is designed for use with the 103IM and 106IM family of One Systems products only.

**!DO NOT SUBSTITUTE OTHER LOUDSPEAKER ENCLOSURES!**

The PT-10 has been designed as a low cost yet flexible pan and tilt system and is intended for use with small format, low Q loudspeaker systems. The PT-10 offers 10 degree aiming increments and will provide up to 5 steps within the nominal 100 degree pattern of either the 103IM or the 106IM. Figure 12 represents the PT-10 pan and tilt bracket.

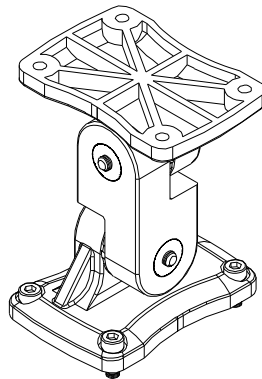


Figure 12

There are two center pieces that may be used for aiming with the PT-10 bracket. Each “center piece” offers aiming resolution of 20 degrees but substitution of the center pieces will yield aiming resolution of 10 degrees.

Figure 12a shows the two center pieces. The 10 degree aiming resolution is achieved by substituting the appropriate center piece to achieve a TOTAL resolution of 10 degrees between the two center pieces. These two center pieces are interchangeable and may be used to set the desired angles.



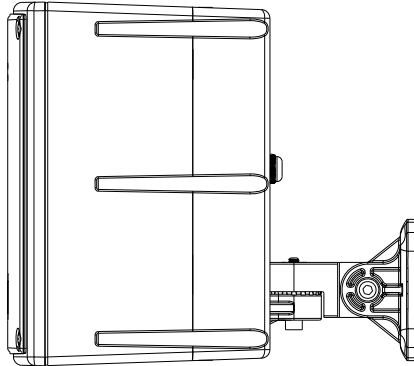


Figure 13

## 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.

103IM .....	67 in <sup>2</sup> (43,000mm <sup>2</sup> )
106IM.....	136 in <sup>2</sup> (88,000mm <sup>2</sup> )
108IM.....	250 in <sup>2</sup> (161,290mm <sup>2</sup> ) (60x40 HF horn)
208CIM.....	207 in <sup>2</sup> (133,550mm <sup>2</sup> )

112IM .....	600 in <sup>2</sup> (387,096 mm <sup>2</sup> ) (60x40 HF horn)
212CIM.....	600 in <sup>2</sup> (387,096mm <sup>2</sup> )
212IM .....	804 in <sup>2</sup> (550,000 mm <sup>2</sup> )
312CIM.....	804 in <sup>2</sup> (550,000mm <sup>2</sup> )
Cross Field Array.....	2,708in <sup>2</sup> (1,750,000mm <sup>2</sup> )