Important Safety Information

This software and associated products are intended for use by professional installers only! The information contained in this software is intended to provide professional installers with basic installation and safety guidelines for Bose RoomMatch™ loudspeakers in typical fixed-installation systems. Please read all product installation and safety guidelines before attempting installation.

**WARNING:** All Bose® products must be used in accordance with local, state, federal and industry regulations. It is the installer’s responsibility to ensure installation of the loudspeakers and mounting system is performed in accordance with all applicable codes, including local building codes and regulations. Consult the local authority having jurisdiction before installing this product.

**WARNING:** Unsafe mounting or overhead suspension of any heavy load can result in serious injury and equipment damage. It is the responsibility of the installer to evaluate the reliability of any mounting method used for their application. Only professional installers with the knowledge of proper hardware and safe mounting techniques should attempt to install any loudspeaker overhead.

**WARNING!** Never apply a force that exceeds the Working Load Limit of any of the loudspeaker modules, rigging components, or complete loudspeaker arrays as described in the product documentation and labels.

The Bose RoomMatch™ Array Frame Suspension Angle Calculator (AFSAC) software is intended to help sound system designers determine RoomMatch array configurations that conform to the acceptable Working Load Limits of the loudspeaker modules and rigging accessories. Additionally, the software predicts the array frame pitch angle when using the integrated pickup points of the left and right rails of the large and small array frames (RMAFLG and RMAFSM) for 2-point attachment to building structures.

The software is not intended for use with any other Bose loudspeakers, nor loudspeakers produced by other manufactures.

The overall safety of a loudspeaker array installation depends on many factors, including the module configurations, total weight, condition of loudspeakers and all associated hardware required to suspend the array, and the external connections to the building support structures. The software cannot account for all the variables required to predict a safe loudspeaker array installation.

The information contained in this software is only a general guideline and cannot, as such, represent all requirements and precautions. Accordingly, anyone using this material assumes all liability and is expressly responsible for the safety of all loudspeaker array designs and mounting configurations applied in practice. For additional safety information, please refer to the RoomMatch Array Design and Installation Manual and other product installation and safety guidelines which are available for download at the pro.Bose.com website.

SYSTEM REQUIREMENTS

The Bose RoomMatch™ Array Frame Suspension Angle Calculator (AFSAC) software requires a PC running Microsoft Excel 2007 (or later versions). This version of the software has not been tested to run on Apple Macintosh versions of Excel.

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USING THE SOFTWARE

Macros Must Be Enabled with Each Use

The AFSAC software requires that macros be enabled each time that the file is opened using Excel. The default operation for Excel is to disable all macro operations; this default value cannot be changed. Thus, each time the AFSAC file is opened, you will be prompted with a Security Warning similar to the following screen:
From this screen, click on the **Options**… icon to access the Macro enable dialog box, similar to the following:

In this dialog box, click on the **Enable this content** choice to enable the macros in the AFSAC file for proper calculations.

Once macro commands have been enabled, the software will check that you are running a compatible version of Excel (Version 2007 or later).

**Main Menu Screen**

The Main Menu will be similar to the illustration below:
From this screen, click on the appropriate Array Frame and configuration to navigate to the data input sheet for the type of array selected. The following array frame configurations are available:

**RMPULL Bracket** allows 1 or 2 full-range modules. Not for use with subwoofer modules.

**Small Array Frame** allows up to 4 modules, either full-range or subwoofer.

**Large Array Frame No Extenders** allows up to 8 modules, either full-range or subwoofer.

**Large Array Frame with Short Extenders** allows the same module count as the standard large-frame version, but adds the extra pickup point positions from the Short Extender Bar (RMXSRT) attached to the frame. Thus, a greater range of downward pitch angles is available when using 2-point, gravity-hang suspension. Also allows subwoofer modules to be mounted behind the primary array with choice of either “IN” or “OUT” subwoofer positions. For information regarding the advantages for each option, please refer to the detailed instructions contained in the document “RoomMatch Array Rigging Frames and Accessories Installation and Safety Guidelines,” which is available for download at pro.Bose.com.

**Large Array Frame with Long Extenders** allows the same module count as the standard large-frame version, but adds the extra pickup point positions from the Long Extender Bar (RMXLNG) attached to the frame. Thus, a greater range of downward pitch angles is available when using 2-point, gravity-hang suspension. Also allows subwoofer modules to be mounted behind the primary array with choice of either “IN” or “OUT” subwoofer positions. For information regarding the advantages for each option, please refer to the detailed instructions contained in the document “RoomMatch Array Rigging Frames and Accessories Installation and Safety Guidelines,” which is available for download at pro.Bose.com.

**DATA INPUT**

The Data Input sections are similar for all Array Frame types. The cells that require user-supplied data are highlighted with yellow. The type of module for each position in the array is selected by using the pull-down menu choices for module coverage pattern. Start by selecting the Horizontal coverage for the module in the first (top) position. The subwoofer module choice is displayed with the model number. The available choices for Vertical pattern are then listed in the second column; select the appropriate value. Continue selecting the Horizontal, then Vertical patterns for each module in the array.

Once the configuration of the modules in the array has been specified, input the desired array pitch into the Modeler Array Pitch cell highlighted with yellow. The Modeler Array Pitch is defined by the acoustic axis pitch angle of the top full-range module in the array, referenced to the building horizon. The acceptable numeric values range from +35 to -45 with downward pitch expressed by negative values. The Data Input Section for the Small and Large Array Frames is similar to the illustration below:

**Calculated Values**

For data supplied in the Input Section, values are automatically calculated for the following values:
**Calculated Array Weight** is displayed in both kg and lbs and includes all modules and frame accessories as specified by the frame type in the main menu and module input section.

**Array Center of Gravity** is displayed for the X and Z axis in both kg and lbs. The Center of Gravity dimensions are referenced to the side-plate forward-most fastener position of the first (top) module of the array. See below.

![Reference fastener](image)

**Array within WLL?** (Working Load Limit) displays either “YES” or “NO” based on calculated values. All calculations are based on a 10:1 Safety Factor (design factor) and cannot be changed by the user.

**Include RMPULL?** Pull-down menu to select “YES” or “NO” if the RMPULL bracket should be used for calculations.

**Calculated Pickup Position** displays the estimated pickup position using the array frame numbering system for the Left and Right array frame rails. The pickup point for array frames is always referenced to the shackle holes for the left and right rails. The center rail of the array frames is intended only for temporary attachment and has a different hole pattern as compared to the left and right rails. The shackle holes on each rail have a top and bottom position. However, the pickup point positions are numbered sequentially from 1 to 32 for the Large Frame and 1 to 33 for the Small Frame, without reference to the top or bottom positions. Both left and right rails have a label that identifies the starting point of the pickup position numbering and direction of increment. The label does not contain numbering for every single position. **Note:** Do not use pickup point reference numbering for center rail!

**Extender Bar Pickup Point Reference:** The pickup point reference for the Extender Bars starts with 1 number greater than the last number of the Large Array Frame. Thus, the first pickup point reference number for the Extender Bars is 33.

![1 2 3 4 5 6 7](image)

![33 34 35 36 37 38 39](image)

**Large Array Frame**

**Extender Bar**

**Predicted Frame Pitch** displays the calculated array frame pitch, as referenced from the top of the array frame relative to the horizon. Downward pitch is indicated by negative numbers while upward pitch is indicated by positive numbers. Always compare the Predicted Frame Pitch value to that of the Target Frame Pitch value (of the Input Section), to confirm you have not exceeded the pitch angle possible using the available pickup points of the array frame.
Note: Prediction Accuracy: To confirm the accuracy of the predicted pitch angles, both the Small Array Frame and Large Array Frame were tested to compare actual constructed array pitch angles versus the predicted values. The testing revealed an accuracy of 96% using a tolerance of 2.0 degrees from predicted value. Many factors contribute to the variation including manufacturing tolerance. Therefore, we always recommend confirming the array pitch during installation with an inclinometer, and making adjustments in the predicted pickup point as required.

Messages Dialog Box

The Message Box will display text to confirm that the array is within acceptable load limits or display warnings that values have been exceeded. When the design is within acceptable limits, a message similar to the following will be displayed:

Array Design is Within Acceptable Limits

When the array is within acceptable load limits yet the target pitch angle is greater than what can be achieved using the pickup points of the specified frame, the message box will indicate that a Pull-Back bracket can be used to achieve the desired pitch:

Array Design is Approaching the Module WLL
A Pull Back Bracket is Recommended

When the array is nearing the load limits, the Messages Box background color will change to yellow and indicate that the design is approaching the load limits, similar to the illustration below. Adding additional modules or additional pitch angle will likely cause the array to exceed load limits.

Array Design Exceeds the Module WLL
A Pull Back Bracket is Required

To correct the fault condition of the “Pull Back Bracket is Required” message, return to the “Array Calculated Values” section, locate the “Include RMPULL?” input and select “YES” from the pull-down menu. When use of the RMPULL bracket returns the array to acceptable WLL values, a message similar to the following illustration will be displayed:

Array Design is Acceptable IF a Pull Back Bracket is Used
RMPULL Calculated Values

When the RMPULL bracket is selected in the “Array Calculated Values” section, values specific to the RMPULL bracket are displayed below the Message box similar to the following illustration:

This section calculates and displays the load from the RMPULL connection to the support structure. A diagram is also presented to illustrate the distance points and angles calculated. (Please note that the number of array modules displayed in this diagram does not change and may not reflect the actual number of modules used for calculations.) For example, the diagram symbol “3” indicates the distance between the Array Frame pickup point (symbol “1”) and the RMPULL bracket pickup point (symbol “2”).

The value indicated in the “Frame Angle with RMPULL” value box is the predicted angle of the Array Frame and building frame of reference or horizon line, when the load values and pickup positions indicated are applied to the array. This angle is illustrated by symbol “5” in the diagram.

If the RMPULL bracket is NOT selected in the pull-down menu, then no values are displayed in the RMPULL Calculated Values section.

Array Center of Gravity and Module Axis Graph

At the bottom of each array frame calculation sheet, a chart displays the array center of gravity axis line, module reference location, and module acoustic centerline pitch. The X and Z axis values of the chart are displayed in centimeters. The coordinates of the chart are referenced to the location of the top, front-facing, side-plate fastener of the first module.

The center of gravity for the combined array (sum of all specified modules) is displayed as a dotted green line. The center of gravity for each individual module is displayed by a unique symbol and line color, with the arrow indicating the acoustic vertical axis for each module, similar to the following illustration:
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SUM OF FIFTY DOLLARS ($50), REGARDLESS OF WHETHER SUCH LIABILITY IS ASSERTED ON THE BASIS OF
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relief in favor of Bose (without proof of actual damages) in the event of any such actual or threatened breach (in addition to any
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April 11, 1980. Each of the parties hereto agrees that any action at law or in equity arising out of or relating to this
Agreement shall be filed only in state or federal court located in Boston, Massachusetts, and each party hereby irrevocably
and unconditionally consents to the exclusive jurisdiction of such courts over any suit, action or proceeding arising out of this
Agreement, and waives any objection to venue of any action instituted hereunder in accordance with the provisions of this
Section.

15.2 SEVERABILITY. If any term, provision, or portions thereof, of this EULA shall be found to be illegal or unenforceable, then,
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