

Installation Instructions Diva[®] Acoustical Tower



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Visit the Diva Acoustical Shell web page at wengercorp.com for more information.

Note: Please read and understand these instructions before installing.Note: Review all of the Installation Drawings and Reference Drawings.Note: Three or more people are recommended to work together during assembly and installation.

Note: If you need additional information, contact Wenger Corporation using the information below.

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Important User Information

General

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Manufacturer

The Diva® Acoustical Tower is manufactured by:

Wenger Corporation 555 Park Drive Owatonna, MN 55060 (800) 4WENGER (493-6437) • +1 (507) 455-4100 wengercorp.com

Intended Use

- The tower is intended for indoor use only and is not intended for outdoor use.
- Never expose the tower components to wind, humidity, or wet conditions.
- This product is intended to be assembled only as described in these instructions.

Installation

- The tower installation and use must comply with local regulations and codes.
- All personnel (including all temporary workers) installing or maintaining the tower must read and understand these and other related installation instructions.

Warranty

This product is guaranteed free of defects in materials and workmanship for five full years from date of shipment. A full warranty statement is available upon request.

Safety Precautions

Throughout this document you may find cautions and warnings which are defined as follows:

- WARNING: Failure to follow the instruction could result in serious injury or damage to property.
- CAUTION: Failure to follow the instruction could result in minor injury or damage to property.

Read all of these safety instructions before using the equipment.

AWARNING

Make sure that anyone working with the Diva Acoustical Tower has read and understands these instructions. AWARNING

Failure to comply with Warnings and Cautions in this document can result in damage to property or serious injury.

AWARNING

Always observe and comply with the Warnings and Cautions posted on the system equipment.

Before Installation

- 1. Read and understand the entire tower installation section before starting the installation.
- 2. Make sure that all personnel installing (including any temporary workers) are trained and understand the installation procedure.
- 3. Review all installation drawings and reference drawings. Save these drawings for future reference.
- 4. Make sure that all items on the shipment packing list are present.
- *Note:* These instructions describe typical assembly and installation of 16' (4877 mm) tall towers. Towers taller than 24' (7315 mm) require frame extensions as explained in these instructions. All Diva Acoustical Shells are installed in the same way.

ACAUTION

Components can be heavy or difficult to handle and may require three or more people working together to lift or assemble.

ACAUTION

To avoid damage to tower surfaces:

- Always wear gloves during assembly and installation.
- Lay any finished surfaces onto the cardboard and foam packaging to help protect from damage.
- During assembly, dropped hardware can roll under other components and cause damage to finished surfaces.

Required Tools

The following tools are required for assembly.

- Assorted wrenches
- · Cordless drill and cordless impact driver
- 3/8", 7/16", 1/2" and 9/16" hex nut bit
- 3/8" drift pin
- Mallet
- 24" carpenters' square
- 9/32" and 25/64" drill bit
- Chalk line
- Box level
- C-clamp set
- Phillips screwdriver

- Hex wrench set
- 3/8", 1/2" and 3/4" drive sockets
- 7/16" deep well socket and drive adapter with a universal
- Ratchet
- Angle finder
- 100" measuring tapes (2)
- 25' tape rule
- Claw hammer
- Caulk gun
- Rivet gun

*Save the wood blocks from the tower frame and ceiling truss packaging. They will be used later during the tower assembly.

Rigging Equipment

The installers must supply the following rigging equipment for the tower installation.

- Lifting casters
- Locking clamps
- Chain

- Wing harnesses
- Span set slings
- 1-ton invertible hoist



Fasteners

The fasteners shown below are contained in various Diva hardware kits. Any fasteners remaining when an the installation is complete can be discarded.



Tower Assembly Description

The following illustration describes components used in the Diva Acoustical Tower Assembly.

Fixed Hinge — Bracket that is used to attach the center panels to the vertical frame.	
Rotating Hinge — Rotating hinge that connects the wing panels to the center — panels.	
Vertical Frame — Frame consisting of two — vertical uprights and three or more cross braces. The vertical uprights have fixed and rotating hinges that attach the wing panels and center panels.	
Center Panels — Set of panels that are fixed at the center of the assembly.	
Wing Panel — Outside sets of panels that pivot for storage. The lower panel may be configured as a door.	
Wing Stay — Locks the wing panel in the storage position or performance position.	
Slide Lock — Locks the wing panel to the door panel.	
Weldment Bar — Bracket that holds the lower filler panel when the tower is stored.	
Lower Filler Panel — Panel that can be removed and stored to allow nesting to other tower assemblies for storage.	
Diagonal Brace — Structural member adding stability to the tower assembly — and a means to adjust the tower plumb.	
Counterweighted Frame — Base that supports the vertical structure and balances the tower assembly.	

Tower Installation

The following procedure is described using a 16' (4877 mm) tall Diva Tower. Taller towers are assembled using the same steps but may need to be spliced together. Refer to the installation drawings.

Assemble the Tower Frame

- 1. Assemble the tower frame as shown.
 - a. Layout both the left and right hand vertical tower frames with the flat side of each frame facing toward the outside.
 - b. Position the lower cross brace with the weldment bar facing toward the top and align with the third set of holes in the frames.
 - c. Position the upper cross braces to align with the next set of holes in the frames and then approximately every 8' (2438 mm) thereafter.
 - d. Attach all of the cross braces to both tower frames using two 3/8-16 x 0.750 hex head capscrews in each side.

The capscrews attach directly to a welded nut on the inside of the cross braces.

2. Set the tower frame assembly aside to attach later.



Assemble the Center Panels

Refer to the installation drawings for center panel placement.

- 1. Sweep the floor around the assembly area and place the sheets of cardboard that shipped with the tower onto the floor surface to protect the panel surfaces.
- 2. Place the center panels with the finished surface facing down onto the cardboard and remove the tape holding any protective paper to the face of the panels.
- Cut foam strips to span the entire width of each upper center panel and install it to be fully recessed into the bottom edge of the panel. Then trim each foam strip end to a 45° angle.



Assemble the Center Panels (continued)

- 5. Connect the upper center panel and lower center panel together.
 - a. Slide the panels together and align the edges.
 - b. Connect the two panel inner clips together using a 1/4-20 x 3-1/2" carriage bolt and 1/4-20 lock nut. Tighten until just snug.
 - c. Repeat to connect the panels on the other side.



Separate Lower Filler Panel

- 1. Separate the lower filler panel from the lower center panel by removing the bracket and two screws that secure each side.
- 2. Flip the hasp up to release the hook.
- 3. Slide the lower filler panel away and set it aside.



Attach Trim to the Center Panels

- 1. Align trim strips of matching lengths to both sides of all of the center panels. The ends of the trim strips should match with the gaps between the panels.
- 2. Attach the trim strips to the panels using 1/4-20 x 1" self-drilling screws as shown.



Attach Frame to the Center Panels

 Place the tower frame assembly onto the center panels. Position the weldment bar on the frame assembly to be near the door latch on the lower panel.

Be sure not to trap the hinges of the tower frame inside of the trim at the edges of the center panels. Do not attach the frame to the center panels yet.



Attach Frame to the Center Panels (continued)

- Place wood blocks (that were saved from the packaging) under both sides of the frame assembly to hold it steady and to keep pressure off of the panels. The wood blocks must be at even heights on both sides and positioned to not extend beyond the edge of the frame as shown.
- 3. Align the frame assembly and the center panels: Proper alignment is critical!
 - a. Set the distance between the bottom of the lower center panel and the bottom of the frame assembly to be 28-5/8" (727 mm) on both sides.
 This is a critical measurement!
 - b. The seam between the center panels should be at the center of the middle fixed hinge.
- 4. Attach the fixed hinges to the center panels.
 - a. With the center panels in position and square to the tower frame using a 9/32" drill bit, drill a hole through the inside panel surface only into each panel at each marked location.
 Do not drill through the panel surface on the other side.
 - b. Clean away any wood shavings from drilling.
 - c. Attach the fixed hinges to the center panels using 5/16-18 x 1" hex head tapping screws in the sequence shown below.



Attach Base

1. Attach the base assembly to the bottom of the tower frame using four 3/8-16 x 1" capscrews and 3/8-16 lock nuts on each side.

Only hand tighten the fasteners at this time.



 Attach a 1-8 hex jam nut to each end of both base rods. Turn the nut to be at least 3" (76 mm) in from one end and 5" (127 mm) in from the other end.



Attach Base (continued)

- 3. Attach the brace rods.
 - a. Slide a brace rod into the base and then into the lower cross brace as shown.



Attach Wing Panels

Refer to the installation drawings for wing panel placement.

- 1. Sweep the floor around the assembly area and place sheets of cardboard that shipped with the tower onto the floor surface to protect the panel surfaces.
- Place the wing with the finished surface facing down onto the cardboard and remove the tape holding any protective paper to the face of the panels.
 Orient the panels so the part number label is at the bottom.

Steps 3 and 4 are for non-access door wing panels only! Wing panels that are access doors already have foam strips installed in the panels. Wing panels that are not access doors will require foam strips to be cut and installed between the panels.

- 3. Cut a foam strip to span the entire width of the upper center panel and install it to be fully recessed into the bottom edge of the panel.
- 4. Connect the upper and lower wing panels together.
 - a. Slide the panels together and align the edges.
 - b. Connect the two panel inner clips together using a 1/4-20 x 3-1/2" carriage bolt and 1/4-20 lock nut. Tighten until just snug.
 - c. Repeat to connect the panels on the other side.



Attach Wing Panels (continued)

- 5. Align the seam of the adjacent wing panels with the seam of the center panels. The panels should also be aligned along the top edge.
- 6. Attach the wing panels to the tower frame.
 - a. With the wing panels in position and square to the tower frame using a 9/32" drill bit, drill a hole through the inside panel surface only into each panel at each marked location.
 Do not drill through the panel surface on the other side.
 - b. Clean away any wood shavings from drilling.
 - c. Attach the wing panels to the rotating hinges using 5/16-18 x 1" hex head tapping screws.

ACAUTION

Drill through the upper panel surface only. Do not drill through the lower panel surface on the other side. **ACAUTION** Do not over tighten the screws, damage to the panels could result.

7. Attach trim to the outer edges of the wing panels as indicated on the installation drawings.



Attach Leveler Assembly

- 1. Attach the two leveler assemblies to the bottom of the base.
 - a. Turn the 1-8 hex jam nut on both leveler assemblies to be at the same height.
 - b. Turn each leveler assembly onto the base until the jam nut contacts the bottom of the base.
 - c. Adjust the leveler assembly so that the distance between the bottom of the wing panel and the bottom of the leveler pad is 2" (51 mm).
- 2. Tape the leveling feet to the tower frame to prevent them from falling out when lifting the tower.



Attach Wing Stays

- 1. Assemble both the right and left wing stays.
 - a. Remove the capscrew from the top slot in both wing stay channels.
 - b. The wing stays must be fully extended as shown.
 - c. Screw a wing stay tube into the bottom of the wing stay channel until it is hand tight.

 On the outside of both frame side, attach one wing stay base bracket using two 3/8-16 x 3/4" button head screws and 3/8-16 nylon insert lock nuts.



Wing Stay Channel

(fully extended)

Wing Stay Tube Remove

Capscrew

Wing Stay Channel (fully extended)

Attach Wing Stays (continued)

- 3. Attach both wing stay assemblies to the wing stay base bracket on each side using one 5/16-18 x 1-3/8" capscrew and 5/16-18 nylon insert lock nut.

 5/16-18 nylon insert lock nut.
 5/16-18 x 1-3/8"

 5/16-18 nylon insert lock nut.
 5/16-18 x 1-3/8"
- 4. Attach both wing stays to the wing panels.
 - a. Twist the wing stay tube to loosen and fully extend the wing stay.
 - b. With the wing stay fully extended, place the wing stay plate onto the inside of the wing panel.
 - c. Apply adhesive to the underside of the wing stay plate and reposition it.
 - d. Attach the wing stay plate to the wing panel using four 0.19 dia tri-fold blind rivets.



Attach Slide Lock

- 1. Attach the slide lock to an access door wing panel.
 - a. Position the slide lock assembly to be approximately 3-1/2" (89 mm) from the outer edge of the access door panel and 1/4" (6 mm) from the top of the panel.
 - b. Attach the slide lock assembly to the panel using eight 0.19 dia tri-fold blind rivets.
 - c. Position the slide lock keeper onto the upper wing panel approximately 1-1/2" (38 mm) from the top edge and to be centered over the slide lock.
 - d. Attach the slide lock keeper to the panel using four 0.19 dia tri-fold blind rivets.



Attach Door Pull Handle

- 1. Attach the door pull handle to an access door wing panel.
 - a. Position the Handle to be approximately 6" (152 mm) from the outer edge of the access door panel and 37" (940 mm) from the bottom of the panel.
 - b. Attach the door pull handle to the panel using four 0.19 dia tri-fold blind rivets.



Lifting Tower

Lift the tower assembly to stand upright.



Confirm the weight of the tower assembly and the capacity of the rigging components to generate a rigging plan before lifting the tower.

- Fold up the wing panels on both sides. Wrap a chain around the diagonal braces of the frame and connect it to the edge of the wing panel using a hook, clamp and locking clamps (see photo 1 on the following page).
- 2. Secure the lifting casters to both tower casters using locking clamps *(see photo 2 on the following page)*.
- 3. Attach a span set sling around both ends of the lower cross brace. Keeping the sling under the cross braces, run it to the top of the tower assembly (see photos 3a and 3b on the following page).
- 4. Connect the end of the sling to a hoist and lift the tower assembly.



Lifting Tower (continued)



Photo 1



Photo 2



Photo 3a



Photo 3b



Install Counterweights

 Place counterweights into the base. Consult the installation drawings for required quantities and weights.



- 2. Attach the counterweight cover to the base using four 1/4-20 x 3/4" tapping screws.
- 3. Remove all of the rigging hardware that was used to lift the tower.



4. Remove the tape securing the leveling feet to the frame assembly.



Attach Base Handle

1. Attach a base handle to the base assembly using two 1/4-20 x 1" self-drilling screws.



Store Lower Filler Panel

- 1. To store the lower filler panel:
 - a. Insert the retention cord through the empty hole in both vertical tower frames as shown. Tie a knot in both ends to secure it to the tower frames.
 - b. Rotate the lower filler panel 90° on its side.
 - c. Fit the top of the panel to fit between the retention cord and the inside panel surface. Place the bottom of the panel to rest on the storage bracket. Lean the top of the panel against the inside panel surface.



Attach Lower Filler Panel

- 1. Attach the lower filler panel to the tower assembly by sliding it into position from the outside surface of the tower.
- 2. Flip the hook on the filler panel over the hasp on the center panel and rotate it upward to close. The hook rod length may need to be adjusted if the bottoms of the panels are not flush.



Moving Towers

A separate manual wheeled mover or electric air transporter is required to lift and move the towers.

ACAUTION

Never use the wheeled mover or air transporter for any purpose other than to move and position towers.

ACAUTION

When using the air transporter be sure that all electrical connections will not separate and interrupt power.

1. To move the air transporter when not supporting a tower, tilt the front upward on the rear casters about 10 to 15 degrees.

To move the wheeled mover when not supporting a tower, raise the handle to the upper hook.

- 2. Position the wheeled mover (shown) or air transporter under the tower with the lifting hooks under the lifting brackets on both sides of the tower.
- If using an air transporter, connect the power cord to a 14-gauge extension cord that connects to a fused, grounded, 120 VAC, 15 ampere power source.

Air Transporter

Be sure that the extension cord is long enough to reach wherever the air transporter will be moved.

Prevent cord interference or damage by having another person manage the cord while moving the towers.

ACAUTION

Never attempt to manually lift or move a tower without using a wheeled mover or air transporter.



Moving Towers (continued)

4. Raise the lifting hooks under the lifting brackets by pushing the handle down, under the lower hook on the wheeled mover or by turning on the power switch on the air transporter.

The tower will tilt slightly backward.

5. Slowly move the tower about 5' (1524 mm) from the other towers.

AWARNING

Never move a tower on an inclined surface or ramp.



6. Stop moving the tower and check to be sure that the wing panels are locked in the storage position and that the wing doors are locked to the wing panels.

ACAUTION

Always rotate and lock the tower wing panels to the storage position before moving the tower to or from the performance position.

 With one person pushing the tower and a second person guiding, slowly move (no faster than 1 foot [0.3 m] per second) the tower to the performance position. Be careful to not push the tower into any obstructions on the stage floor or above the stage floor (such as ceiling panels, etc.).

ACAUTION

Two or more people must work together when moving a tower. One person must watch for obstructions on the stage and above the stage while a second person pushes the tower.

ACAUTION

Never move a tower faster than 1 foot (0.3 m) per second.



Moving Towers (continued)

8. When the tower is in the final location, grip the handle of the wheeled mover firmly and slowly move it from the lower hook to the upper hook.

If using an air transporter, turn off the power switch.

The tower will tilt slightly forward until it rests on the floor.

ACAUTION

Keep a firm grip on the wheeled mover handle when raising or lowering towers. Releasing the handle could cause the tower to drop suddenly.

- 9. Remove the wheeled mover or air transporter from the tower.
- 10. Repeat these steps to move the remaining towers to their performance positions based on the layout shown in the Wenger field use drawing.
- 11. Consult with the owner to determine if tower floor markers are to be installed.
 - a. If tower floor markers are required, position all towers in their final performance position. Get approval of the tower locations from the owner prior to installing tower floor markers.
 - b. Install one #14 x 1" brass screw floor marker to be aligned with the rear notch in both of the air mover lifting feet as shown.
 Ensure screws are flush with or just below the top surface of the floor.

ACAUTION

A dangerous pinch point develops when lowering a tower to the floor.



Decals, Numbers and Logos

- 1. On the back side of each tower assembly:
 - a. Attach a tower operation decal onto the right-hand panel near the outer edge with the bottom of the decal about 54" (1372 mm) from the floor.
 - b. Attach a tower warning decal to the onto the left-hand panel near the outer edge with the bottom of the decal about 54" (1372 mm) from the floor.
- 2. Mark the filler panels.
 - a. Place a lettered sticker as provided at the center of the filler panel.
 - b. Place a matching lettered sticker on the lower filler panel directly above the number on the filler panel.
 - c. Use a different letter on each tower.

Final Inspection

- 1. Make sure that all counterweights are in place.
- 2. Fully hand tighten the hex jam nuts on both base rods.
- 3. Make sure that there is no missing hardware or loose fasteners.
- 4. Inspect all tower panels for surface finish damage. Touch up as required.
- 5. Make sure that the over-center latch on the filler panels works smoothly. Adjust the hook rod length if the bottoms of the panels are not flush.
- 6. Make sure that all door closers, slide locks, wings, and wing locks operate smoothly.
- 7. Make sure that the tower is sturdy and that all casters and feet are touching the floor.
- 8. Set up and level the towers as required per the site conditions.