Cyclone dust collectors have been used for decades in industrial applications. They are compact, quiet, extremely efficient and easy to service. Now, these same features that make cyclones so attractive to industry are available to the small-shop woodworker in a unit that is both economical and easy to build.

Our system, intended for a small shop, is powered by a 850 cubic feet per minute (cfm), 1.5 horsepower blower. Our cyclone will work for blowers ranging from 500 to 800 cfm, and was used successfully in both the WOOD® shop and in Idea Shop 3. This is the only size cyclone we've built and tested. After publishing the original how-to plans, we've had several requests for guidelines on building larger units. For a unit with a larger blower, you'll need to increase the size of the cylinder, housing, cone, inlet, outlet, and filter accordingly.

Cyclones are sized according to blower volume (cfm), so using a blower of a different capacity will require changes in the size of the cyclone unit. Use the table on the next page to size the sheet metal parts of the cyclone. The pattern for the inlet hole can be enlarged to match the larger duct sized required with larger blowers. The wooden parts will be the same shape as those in the plan, but you'll need to increase the size of the parts if you plan on using a blower larger than 800 cfm.
Enlarging the cyclone will also mean increasing the thickness of the sheet metal used. A larger blower means more suction on larger expanses of the sheet metal cone and cylinder. Our plan for the 760 cfm blower uses 30-gauge sheet metal. For a larger cyclone we recommend using 26- or 24-gauge sheet metal. Increasing the air volume will also mean increasing the filter area. The generally accepted standard is 1 square foot of filter area for every 10 cfm. of blower capacity. If you are adding a cyclone to an existing bag-type dust collector, keep in mind that a cyclone alone will remove particles down to 15 microns. Make sure that the filter bags are rated to remove particles smaller than 15 microns. Many older bags only remove particles down to 30 microns. The cartridge-type air filter system we used (rated 99.9% efficient) removes dust particles as small as 1 micron. The cartridge filter we used in our system is from NAPA auto parts, #6616. A similar filter is the Hastings AF699. These filters can contain approximately 47 sq.ft. of filter area. Other sources of filters are: TDC Filter Mfg., available from Energy Plus Inc., www.EnergyPlusInc.com or 847-669-1397, and Donaldson Torit Products 800/365-1331.

<table>
<thead>
<tr>
<th>PART</th>
<th>1 H.P. 350-550 CFM</th>
<th>2 H.P. 550-800 CFM</th>
<th>3 H.P. 800-1200 CFM</th>
</tr>
</thead>
<tbody>
<tr>
<td>H cylinder</td>
<td>diameter</td>
<td>height</td>
<td>diameter</td>
</tr>
<tr>
<td></td>
<td>16&quot;</td>
<td>18&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
<td>I cylinder</td>
<td>diameter</td>
<td></td>
<td>diameter</td>
</tr>
<tr>
<td></td>
<td>4&quot;</td>
<td></td>
<td>6&quot;</td>
</tr>
<tr>
<td>J cylinder</td>
<td>diameter</td>
<td>height</td>
<td>diameter</td>
</tr>
<tr>
<td></td>
<td>6&quot;</td>
<td>18&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>K cylinder</td>
<td>top</td>
<td>bottom</td>
<td>height</td>
</tr>
<tr>
<td></td>
<td>16&quot;</td>
<td>6&quot;</td>
<td>18&quot;</td>
</tr>
</tbody>
</table>

A properly operating cyclone dust collector should discharge only a very small amount of the finest dust to the filter. A large amount of dust or any large chips blown into the filter is caused either by an overflowing dust bin or by a dust bin with air leaks. The dust bin must be airtight and the lid must be weather stripped for an airtight fit.

A web site we have found to be helpful is [www.airhand.com](http://www.airhand.com). After building and publishing the plans for this cyclone, we had readers contact us with modifications. See pages 19 through 22 for our readers input.

Jan Hale Svec
Assistant Design Editor
760 CFM, 1½ hp., 62-82 decibel dust collector, more than adequate for a small shop

Cyclone captures 98% of dust before it passes through the blower.

System operates at peak performance since little dust reaches the filter to reduce airflow.

A cyclone is the most efficient dust collector used in the industry.

Fits under a 7'6" ceiling or between floor joists located 7' above the shop floor.

Clear hose lets you see when the can is full.

20-gallon garbage can mounted on casters for mobility when disposing of sawdust

Radio-controlled switch and wireless transmitter

Easy-to-form sheet-metal parts

Cartridge-type air filter (rated 99.9% efficient) to minimize dust emission. Hang it between joists to save space and reduce noise.

Simple-to-construct frame: all pieces from one 4x8 sheet of plywood.

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Radio-controlled switch and wireless transmitter

Easy-to-form sheet-metal parts
### Bill of Materials

<table>
<thead>
<tr>
<th>Part</th>
<th>Finished Size</th>
<th>Matl.</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CYCLONE FRAME</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A blower shelf</td>
<td>¾&quot; 23&quot; 23&quot;</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>B back</td>
<td>¾&quot; 23&quot; 19½&quot;</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>C sides</td>
<td>¾&quot; 10¾&quot; 19½&quot;</td>
<td>C</td>
<td>2</td>
</tr>
<tr>
<td>D cylinder head</td>
<td>¾&quot; 18&quot; 18&quot;</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>E cylinder base</td>
<td>¾&quot; 23&quot; 23&quot;</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>F cone ring</td>
<td>¾&quot; 23&quot; 23&quot;</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>G dolly</td>
<td>¾&quot; 14¾&quot; 14¾&quot;</td>
<td>C</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SHEET-METAL PARTS</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>H cylinder</td>
<td>30GA 20&quot; 57½&quot;</td>
<td>SM</td>
<td>1</td>
</tr>
<tr>
<td>I inlet</td>
<td>30GA 6&quot; diam. 15½&quot;</td>
<td>D</td>
<td>1</td>
</tr>
<tr>
<td>J outlet</td>
<td>30GA 6&quot; diam. 20&quot;</td>
<td>D</td>
<td>1</td>
</tr>
<tr>
<td>K cone</td>
<td>30GA 19½&quot; 20¾&quot;</td>
<td>SM</td>
<td>3</td>
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</tbody>
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<table>
<thead>
<tr>
<th>FILTER</th>
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</thead>
<tbody>
<tr>
<td>L inlet ring</td>
<td>¾&quot; 9¹/₁₆&quot; 9¹/₁₆&quot;</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>M outlet ring</td>
<td>¾&quot; 10&quot; 10&quot;</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>N filter holder</td>
<td>¾&quot; 10¼&quot; 10¼&quot;</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>O filter inlet</td>
<td>30GA 4&quot; diam. 4&quot;</td>
<td>D</td>
<td>1</td>
</tr>
<tr>
<td>P filter housing</td>
<td>30GA 10&quot; diam. 24&quot;</td>
<td>D</td>
<td>1</td>
</tr>
</tbody>
</table>

**Materials Key:**
- C—choice of either medium density fiberboard or birch plywood, SM—30-gauge sheet metal (commonly sold as roof flashing), D—30-gauge galvanized steel, snap-lock, round duct.

**Supplies:**
- From the Frame drawing: #8×2" flathead wood screws; 4–⁹/₁₆" lag screws 2¹/₂" long with 4–⁹/₁₆" flat washers. From the Cyclone Exploded View drawing: 14–¹/₆×1½" hexhead bolts with ¾" flat washers and ¼-20 T-nuts; #6×¾" panhead sheet-metal screws; 6" round duct 20" long; 1"-wide double-faced tape; silicone sealant; ½" steel pop rivets with ½" grip range; 20"-wide by 10'-long roll of 30-gauge roof flashing or sheet metal will be enough for H and K; 6" snap-lock round duct 24" long (initially) for part (I). From the Exploded View drawing: 2–6" round duct starter collars; 2–6" hose clamps; 6" clear flexible hose 12" long, 2–4" hose clamps, 4" flexible hose 24" long, 20-gallon galvanized garbage can with lid; 2–6½" steel utility handles (National 100-115) with 4–#10×1½" flathead machine screws with flat washers and nuts; 4–casters with ¾" washers and nuts, silicone caulk or butyl gutter seal in a squeeze tube; ¾"-thick by ¾"-wide self-adhesive, closed-cell, sponge rubber weather strip, 2–18"-long rubber tie-down straps, 4–#10×2" panhead sheet-metal screws and flat washers. From the Filter drawing: 4" round duct, 4" long; ¾" all-thread rod 17" long with 2–¾" flat washers and 2–¾" nuts; 10" round snap-lock duct 24" long, air filter (cartridge type for diesel trucks, NAPA 6616 or Hastings AF699).

**Buying Guide**
- **Portable dust collector.** 1½ horsepower, 850 cfm blower with four casters, nuts, and washers (use the casters on the bottom of the garbage can). Catalog no. DC3-CSXL. Penn State Industries, 2850 Comly Road, Philadelphia, PA 19154. Call 800/377-7297 to order.

- **Remote switch, air filter, and flexible hose.** Radio-controlled switch and wireless transmitter, 110V, good for collectors up to 1½ H.P., relay/receiver, #LR110. 8" diameter by 16¼"-long air filter, product no. CYFILT. 12" length of 6"-diam. clear flexible hose and clamps and a 5’ length of 4"-diam. flexible hose and clamps, product no. CYKITW. Penn State Industries, address and phone number listed above.
CUTTING DIAGRAM

3/4 x 48 x 96"
med. density fiberboard or birch plywood

- Indicates preliminary cuts
FRAME PARTS VIEW

A BLOWER SHELF

5/32" holes, countersunk

4 1/8" hole

R = 11 1/2"

11 5/16"

R = 8"

11 5/16"

5/16" holes

23"

BLOWERSHELF 23"

5/16" holes, countersunk on bottom face

5/16" holes

R = 9"

R = 11 1/2"

5/16" holes

10 1/4"

Cylinder Base 23"

5/32" holes, countersunk

CONE RING

5/16" holes

6" hole

R = 9"

R = 8"

11 5/16"

10 1/4"

DOLLY (for use under dust bin)

D CYLINDER HEAD

3/8" holes

R = 7 3/8"

R = 6 3/4"

4 3/4"

6"

INLET SIDE

3/8" holes

R = 9"

R = 10 1/4"

R = 11 1/2"

R = 10 1/4"

Back edge

T M
**Note:** See the Buying Guide at the end of the Bill of Materials for our source of the blower, switch, and air filter we used for building this project.

**OK, let's start with the wooden framework**

1. Cut the blower shelf (A), back (B), sides (C), cylinder head (D), cylinder base (E), and cone ring (F) from 3/8" medium density fiberboard or birch plywood to the sizes listed in the Bill of Materials.

2. Using the Frame drawing at right and the Frame Parts View drawing on the previous page, lay out the shapes for the blower shelf (A), cylinder head (D), cylinder base (E), and cone ring (F). (We found trammel points great for marking the large arcs. See the August 1997 issue of WOOD® for our homemade trammel.) Cut the pieces to shape, and sand the exposed edges smooth.

3. Drill blade start holes on the waste side of the cutlines for the holes in the blower shelf (A), side (C), cylinder head (D), cylinder base (E), and cone ring (F). Cut the holes with a jigsaw.

4. Center the cylinder head (D) on the bottom side of the shelf (A), aligning the hole of one over the other. Clamp the two together. Drill four 5/16" holes for securing the cylinder head to the shelf later. Now, do the same with the base (E) and cone ring (F).

5. Glue and screw the blower shelf (A) to the back (B) and sides (C).

6. To form the dolly (G) shown on the Exploded View drawing on page 12, measure the inside diameter on the bottom side of your garbage can (our 20-gallon can measured 14 3/4″). Cut the dolly disc to shape.

7. Prime and paint the parts A–G, except D. (We used Hammerite, a paint with a textured finish.)
And now for a little sheet-metal work

*Note:* Don’t have any experience with sheet metal? Not to worry. We’ve kept the sheet-metal work to a minimum and used off-the-shelf pieces where possible.

1. Scribe the cutlines, and cut a piece of sheet metal to 20”×57½” for the cylinder blank (H). (Using aviation-style tin snips, we cut ours from 20”-wide, 30-gauge roof flashing, purchased from a local hardware store. A 10’ section is enough for the cylinder H and the three cone segments K.)

2. Copy (at 125%) and transfer the inlet-hole pattern from page 18, and adhere it with spray adhesive to the cylinder blank (H) where shown on the pattern on page 16. If your sheet metal came in a roll, place the curl side down on the workbench. The side facing up (what was the outside face of the roll) will be the outside of the cylinder.

3. Drill a ½” hole about ½” inside the inlet-hole pattern cutline. Staying about ½” inside the pattern line, cut out most of the waste with metal snips. (We found it difficult to cut to the line without first removing this waste.) Cut along the pattern line to finish forming the opening. Remove the paper pattern.

4. Using a centerpunch, mark the hole centerpoints along both sides and one end of cylinder blank (H) for the sheet-metal screws and the rivets. Mark the centerpoint at the end of the teardrop-shaped cutout in H. Drill the holes. See the pattern on page 16 for reference.

5. Test-fit the sheet-metal cylinder blank (H) around the cylinder head (D) to verify the 1” overlap. Use an awl to scribe the overlap line on the cylinder. Apply a 1”-wide strip of double-faced tape aligned with the overlap line, and adhere the other end of the blank, forming a cylinder.

6. Clamp a piece of 2×4 on edge to your workbench so that 22” extends out from the bench. Slide the cylinder (H) over the protruding 2×4, centering the overlapped taped seam on the 2×4. Drill ¼” holes and pop-rivet the cylinder together, leaving the tape in place to seal the seam where shown on the Rivet detail accompanying the Cyclone Exploded View drawing.
7 Use a hammer and block of wood to seat the T-nuts in the ¾" holes in the cylinder head (D). Fit the cylinder head into the top of the cylinder (H). Drill pilot holes through the cylinder and into the edge of the cylinder head. Drive the screws to connect the two, making certain the top surface of the cylinder head is flush with the top edge of the metal cylinder.

8 Copy (at 200%) the pattern for the inlet (I) from the Full-Size Half-Patterns (You will need to make two copies and cut one out and then reverse it to get the whole pattern), and adhere it with spray adhesive to a piece of 6"-diameter snap-lock round duct 2½" long. Do not snap the duct together until the end of the inlet has been cut. Align the straight end of the paper pattern with the uncrimped end of the duct. Using metal snips, cut along the curved pattern lines, and then make the cuts to form the tabs at the same end.

9 Drill the ¾" rivet holes in the end of the inlet and in every other tab where marked. Now, remove the paper pattern, and snap the seam together.

It's time to connect the inlet and outlet
1 Position the inlet (I) in the teardrop-shaped cutout in the cylinder (H) so the ends of the tab cuts are flush with the surface of the cylinder. Align the rivet hole at the end of the teardrop-shaped cutout in the cylinder with the inlet at the pointed end of the inlet. Pop-rivet them together.

2 Bend the tabs on the inlet (I) over so they are flat on the inside of the cylinder (H). Now, drilling from the inside and riveting from the outside, drill through every other tab and through the cylinder. Pop-rivet the inlet to the cylinder, checking to make sure that the inlet remains properly aligned in the hole in cylinder (H).

3 Cut the outlet (J) from a piece of 6" round duct, cutting off the crimped end. Do not snap the duct together until the outlet has been cut. Snap the seam together, and insert the outlet into the hole in the center of the cylinder head (D). Make certain the top edge of the outlet is flush with the top surface of the cylinder head. Drill the pilot holes, and screw the outlet to the cylinder head. See the Shelf detail for reference.

Time to add the cone
1 Lay out the three cone segments (K) on 30-gauge galvanized steel sheet metal. Mark the pop-rivet centerpoints with a punch. Use an awl to scribe the overlap lines. Cut the pieces to shape with the aviation-style metal snips, and cut along the lines to form the tabs at the top of each segment. Apply 1"-wide strips of double-faced tape, aligned with the scribed overlap lines. Stick the first two segments together as shown in Photo A on page 8.

2 As shown in Photo B, drill ¼" holes at the marked centerpoints. Pop-rivet this first joint to join the first two cone segments. Repeat this process to fasten the third segment to the first two.

3 Clamp the 2x4 flat on the workbench as shown in Photo C. Clamp the taped edge of the three joined cone segments to the 2x4 using another board aligned with the overlap line to hold it flat. Using the clamping board as a guide, adhere the free end of the joined cone segments to the tape, forming a cone (K) as shown in Photo C. Drill ¾" holes at the marked centerpoints, unclamp the cone, and pop-rivet the overlapping edges together.

Add the starter collar and cone ring to the cone
1 Reclamp the 2x4 on edge to the workbench. Mark the location of every other tab of the 6" starter collar around the outside of the bottom opening of the cone. Insert the tabs of the starter collar into the cone, and slide the cone and starter collar over the 2x4. Drill through the cone and the tabs as shown in Photo D. Pop-rivet the collar into place.

2 Support the edge of your cone ring (F) on the edge of your workbench as shown in Photo E. Drop the completed cone (K) into the ring and bend down the tabs as shown in the photo.

3 Place the cone on the workbench with the tabs down. Clamp the cone ring down tightly. Clean the metal with denatured alcohol, and apply sealant to the joint between the cone and the starter collar and in the gap between the cone and the cone ring where shown on the Cylinder Base detail on the next page.
Next, construct the main body of the cyclone

1 Position the shelf/back/side assembly (A, B, C) on its back on your workbench, and attach the cylinder head/cylinder/inlet/outlet assembly (D, H, I, J) to it with four 5/16\times1\frac{1}{2}\text{"} hexhead bolts and flat washers where shown on the Cyclone Exploded View drawing and accompanying Shelf detail.

2 Clamp the cylinder base (E) to the open bottom end of the cylinder (H), and against the bottom ends of the back (B) and sides (C). Now, working from the inside of the metal cylinder, drill the holes and screw the cylinder to the base (E). See the Cylinder Base detail for reference.

3 Remove the clamps. Then, remove the bolts connecting the cylinder head (D) to the blower shelf (A). Set the D, E, H, I, J assembly on its base on the workbench, and seat the T-nuts in the 5/16\text{"} holes in the cylinder base (E).
The dust bin comes next
1 Cut a 6" hole in the center of the lid of a 20-gallon galvanized steel garbage can. Insert the tabs of a 6" starter collar into the hole, and bend the tabs over on the inside of the lid.
2 Working from the bottom side of the lid, drill 3/8" holes through every other tab and through the lid. Working from the top side of the lid, pop-rivet the lid to the starter collar.
3 Drill holes through the lid and attach a pair of metal handles to the shapes shown on the Exploded View drawing.
4 Clean the metal as before, and apply sealant to the joint between the starter collar and lid. Then, clean the metal around the inside rim of the lid, and adhere a ring of 3/32x3/4" self-adhesive, closed-cell sponge rubber weather stripping.
5 Fit the dolly (G) inside the lip on the bottom side of the garbage can. Drill four 3/8" holes through the dolly and through the bottom of the garbage can. (The four casters and mating hardware come with the blower sourced in the Buying Guide.) Secure the casters to the dolly and garbage can. Put the lid on the can and roll it aside.

An air filter keeps the fine dust in
1 Mark the outlines of the inlet ring (L), outlet ring (M), and filter holder (N) on 3/4" medium density fiberboard or birch plywood to the shapes shown on the Filter Parts View drawing.
2 Drill 3/8" holes in the interior waste portion of L, M, and N, and jigsaw to the lines.
3 Mark the centerpoints for the four 3/16" holes on the outlet ring (M). Center the outlet ring on the filter holder (N), and clamp them.
together. Drill the 5/16" holes through both pieces. Unclamp the pieces, and drill a 5/8" hole through the center of N.
4 Finish-sand the pieces, and paint parts L and N.
5 Cut a piece of 4" snap-lock duct for the filter inlet (O) to 4" long, snap it together, and insert it into the hole in the inlet ring (L). Drill the pilot holes and screw the pieces together.
6 Seat the T-nuts in the 5/16" holes in the outlet ring (M). Snap a 24"-long section of 10" snap-lock duct together to form part (P). Fit the inlet ring (L) into the crimped end where shown on the Filter drawing. Drill pilot holes, and screw the duct to the inlet ring.
7 Fit the outlet ring (M) into the uncrimped end of P. Drill the pilot holes, and drive in the screws.
8 Clean the metal, and apply sealant around the inside of the filter housing (P) where the duct meets the inlet and outlet rings and where the inlet (O) meets the inlet ring.
9 Fasten the cartridge filter to the filter holder (N) with a 17"-long piece of 5/8" all-thread rod, washers, and nuts, making certain the cartridge is centered on the filter holder. Slide the cartridge/filter holder assembly into the filter housing, and fasten it into place.

**Note:** See page 14 for a quick and quiet improvement you can add to the filter.

**Final assembly**
1 Drill holes through the back (B) for mounting the unit to the wall later. See the Frame drawing for reference. Position the holes so you hit at least one stud (and ideally two) in the wall. Fasten the bracket assembly (A, B, C) to the wall so that the top of the blower shelf (A) is level and 76" from the floor. The total height required for the dust collector is 90". If there is not sufficient clearance underneath the floor joists, position the assembly (A, B, C) so that the blower motor will be located between two floor joists. Allow for a minimum clearance of 1" over the top of the blower motor.
2 Fit the cylinder assembly (D, E, H, I, J) into the bracket assembly by rotating it enough to fit the inlet (I) through the hole in the side (C), and fasten it in place with 3/8" bolts. Then, secure the cylinder base (E) to the back (B) and the sides (C) with 2" wood screws.
3 Position the cone assembly (F, K) underneath the cylinder base (E), and fasten it in place with 3/8" bolts, sandwiching the 1" tabs of the cone (K) between the cylinder base and the cone ring (F) where shown on the Cyclone Exploded View drawing.
4 Attach a 12" length of 6" flexible hose to the starter collar at the bottom of the cone with a hose clamp. Position the dust bin
under the cone, and attach the other end of the hose to the starter collar on the can lid with a hose clamp where shown on the Exploded View drawing.

5 Adhere a piece of ¾ x ½" weather stripping to form a ring approximately 11" in diameter to the intake (bottom) side of the blower. Seal any unused bolt holes in the blower. (The blower comes mounted to a frame.) Set the blower in place on the blower shelf (A) with its intake flange inserted into the 4 ½"-diameter hole. Hang the filter assembly (L, M, N, O, P) between two conveniently located floor joists, using a pair of rubber tie-down straps where shown on the Exploded View drawing. Connect the blower to the filter with a length of 4" flexible hose and two hose clamps.

6 Hook up the dust-collection piping to the inlet (I).

7 For convenience, we plugged the blower into a radio frequency controlled switch so we can operate it from any location in the shop with a wireless transmitter.

8 Periodically you'll need to remove the filter and blow it out. Also, by watching the clear hose above the garbage can, you'll be able to tell when the can is full.

Written by Marlen Kemmet
Project Design: Jan Hale Svec
Illustrations: Kim Downing; Lorna Johnson
Graphic Design: Lorna Johnson
Photographs: John Hetherington; Bill Hopkins
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A quick and quiet cyclone improvement

After living for a few months with the cyclone dust collector, we came up with a way to lower its noise level. Since most of the noise comes out of the exhaust, we fashioned a simple muffler that goes between the exhaust hose and the filter.

To build one for your own cyclone, first snap together a 24" length of 10" round duct. Mark a 4"-diameter hole with its center 5" from the crimped end. Cut the hole with metal snips, and install a 4" starter collar as shown below. Fasten a 9 11/16"-diameter disc of 3/4" plywood inside the crimped end with sheet-metal screws. Seal the inside of the joint between the disc and duct with silicone sealant.

Buy a piece of 2x24x40" foam from your local fabric store. Cut a 2x23 1/2 x 31 7/16" piece of foam, fit it into the duct, and mark the location of the inlet hole. Now, remove the foam, cut the inlet hole, and replace this liner. Cut a 6"-diameter foam disc and place it into the muffler and against the wood disc.

To install the muffler, remove the inlet assembly from the filter housing and fit the filter and muffler assemblies together. Fasten the crimped end of the filter to the plain end of the muffler with sheet-metal screws and aluminum appropriate location, such as between floor joists, and reconnect the hose from the blower.

We trust you will enjoy the reduction in decibels as much as we have.

—Jan Svec, Assistant Design Editor/Project Builder
1/8" holes for pop rivets, drilled after cone is assembled. Use a strip of 1"-wide double-faced tape to hold the edges together at the overlap.

Note: Move radius centerpoint 1/2" in from edge of sheet metal when laying out radii.
Inlet hole 4

3/4" holes for pop rivets, drilled after cylinder is formed. Use a 1"-wide strip of double-faced tape to hold the ends together at the overlap.

Drill rivet holes for the inlet 1 after 1 has been placed through the inlet hole.

1/8" hole drilled before assembly

Mark locations for #6 panhead sheet-metal screws.

Cylinder

30-gauge galvanized-steel sheet metal

Overlap line

3/8" 28 3/4"

1 1/2"

1/2"

3/8" 20"

57 1/2" 20"

57 1/2"
One square=1"
(scaled at 50%)
Increase the performance of your cyclone

I downloaded the plans for the cyclone dust collector from your Web site, and built it pretty much as shown. My only departures were a 2-hp blower and felt filter bags. At the end of a 4’ length of duct connected to the cyclone’s inlet, I measured an air flow of 350 cfm. After installing a “neutral vane” inside the cyclone, shown on Drawing 1, the flow increased to 525 cfm. This is a significant increase in performance for such a simple modification, and is well worth trying out.

—John Dillbeck, Shell Knob, Mo.

Another reader recently called us for advice on building the cyclone, and described the same sort of deflector inside an old cyclone that was once part of a piece of farm machinery. Perhaps they knew something we didn’t when we designed our cyclone.

It wouldn’t be too difficult to retrofit an existing cyclone in this manner. But better yet, incorporating a similar detail in a new cyclone would simplify its construction. When forming the teardrop-shape cutout in the cyclone’s cylinder (H), leave three tabs around its perimeter, where shown on Drawing 2. Bend the tabs into the cylinder, and trim the end of the inlet duct (I) at an angle so it clears the outlet duct. Insert the inlet and pop-rivet the tabs to it, where shown on Drawing 3. Seal around the inlet/cylinder joint on the outside with caulk.

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**Drawing 1**

*Neutral vane*

**Drawing 2**

*Location of Riveting tabs on Part (H)*

**Drawing 3**

*Part (1) cut at a slight angle*
How to know when you’re almost full

I must say that your homemade “Cyclone” certainly encompasses all one’s needs in a basement-type dust collector. It’s compact, quiet, inexpensive, and fairly easy to make. Congratulations to Mr Svec and all who helped to bring his creation to life.

However, I noticed that you use a clear, flexible hose to attach the bottom of the Cyclone to the garbage can that “lets you see when the can is full.” Trouble is, the can would then be overfull.

Instead, I suggest cutting out a narrow vertical opening (one inch) in the side of the garbage can, beginning about 3” from the top of the can, and ending about 3” from the bottom. Then, using construction adhesive, attach a strip of clear plastic to the inside of the can, overlapping the cut-out section as shown below. This strip must be sealed air tight. Now you have a window that lets you see how full the can really is.

—Rich Lacey, Willowick, Ohio
Knowing when to clean an air filter

How do you know when the filter on the WOOD\textsuperscript{e} cyclone dust collector needs cleaning? I added a simple air-pressure gauge called a manometer. Here’s how.

Mount a U-shaped loop of $\frac{1}{4}”$ i.d. clear plastic tube (available from hardware stores or home centers) on a board, and attach one end to the filter housing, as shown in the drawing. You can mount the board on a joist adjacent to the filter. Fill the tube about halfway up the U with colored water. Mark the level of the water with the cyclone off. This lets you keep tabs on the evaporation of water from the tube. I haven’t tried it yet, but I hear that you can eliminate evaporation by floating a small drop of light oil on top of the water on each side of the U.

With the filter clean, and one blast gate open, switch on the cyclone. The pressure backing up behind the clean filter will push the water a distance up the open leg of the U. Mark this level. Now, as the filter loads up, additional pressure pushes the water farther up the tube. With the same blast gate open, when the water level reaches $\frac{1}{2}”$ beyond the clean-filter mark, service the filter. I find that the WOOD cyclone looses about 100 CFM for each half-inch increase in the height of the water column.

Back-flash Cyclone, too

Thanks for the great Cyclone Dust Collector project. Your choice of a NAPA air filter was excellent. I have been using this set-up to back-flush it and extend its life: I disconnected the filter and installed several adapters so that I can connect inlet and outlet hoses of my shop vacuum. The closed-loop system effectively cleans the filter without disassembly and a dusty mess.

—Ken Gossafe, Bellevue, Wash.

Gain static pressure with reducer

Congratulations on your Cyclone Dust Collector design. I built the collector and was impressed with the clear instructions. As a retired mechanical engineer, I do have one suggestion. I calculated the static pressure (S.P.) in order to size the ductwork, and discovered a drop of .85" S.P. at the abrupt exit from the collector to the fan inlet. By installing a 6×4" reducer fitting before exiting the dust collector, I saved approximately .72" S.P.